Series 1961, No. 4 Issued April 1964

SOIL SURVEY

Adair County Kentucky

OUR SOIL ★ OUR STRENGTH

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
KENTUCKY AGRICULTURAL EXPERIMENT STATION

HOW TO USE THE SOIL SURVEY REPORT

THIS SOIL SURVEY of Adair County, Ky., will serve several groups of readers. It will help farmers in planning the kind of management that will protect their soils and provide good yields; assist engineers in selecting sites for roads, buildings, ponds, and other structures; aid foresters in managing woodland; and add to our knowledge of soil science.

Locating Soils

Use the index to map sheets at the back of this report to locate areas on the large map. The index is a small map of the county on which numbered rectangles have been drawn to show where each sheet of the large map is located. When the correct sheet of the large map has been found, it will be seen that boundaries of the soils are outlined and that there is a symbol for each kind of soil. All areas marked with the same symbol are the same kind of soil, wherever they occur on the map. The symbol is inside the area if there is enough room; otherwise, it is outside the area and a pointer shows where the symbol belongs.

Finding Information

This report contains sections that will interest different groups of readers, as well as some sections that may be of interest to all.

Farmers and those who work with farmers can learn about the soils in the section "Description of Soils" and then turn to the section "Use and Management of Soils." In this way, they first identify the soils on their farm and then learn how these soils can be managed and what yields can be expected. The "Guide to Mapping Units, Capability Units, Woodland Suitability Groups, and Wildlife Productivity Groups" at the back of the report will simplify use of the map and the report. This guide lists each soil and land type mapped in the county and the page where each is described. It also lists, for each soil and land type, the capability unit, woodland suitability group, and wildlife productivity group and the pages where each of these is described.

Foresters and others interested in woodland can refer to the section "Woodland Uses of Soils." In that section the soils in the county are grouped according to their suitability for trees, and factors affecting the management of woodland are explained.

Engineers will want to refer to the section "Engineering Uses of Soils." Tables in that section show characteristics of the soils that affect engineering.

Scientists and others who are interested will find information about how the soils were formed and how they were classified in the section "Formation, Classification, and Morphology of Soils."

Students, teachers, and other users will find information about soils and their management in various parts of the report, depending on their particular interest.

Newcomers in Adair County will be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "General Nature of the County," which gives additional information about the county.

* * * * *

Fieldwork for this survey was completed in 1961. Unless otherwise indicated, all statements in the report refer to conditions in the county at that time. The soil survey of Adair County was made as part of the technical assistance furnished by the Soil Conservation Service to the Adair County Soil Conservation District.

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SOIL SURVEY OF ADAIR COUNTY, KENTUCKY

BY FRED S. ARMS, DONALD S. HENRY, ALBERT S. JOHNSON, WILLIE R. PARTIN, THOMAS G. SPARKS, and ORVILLE WHITAKER,[1] SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE IN COOPERATION WITH THE KENTUCKY AGRICULTURAL EXPERIMENT STATION

ADAIR COUNTY is in the south-central part of Kentucky (fig. 1). It has an area of approximately 393 square miles, or 251,520 acres. Columbia is the county seat.

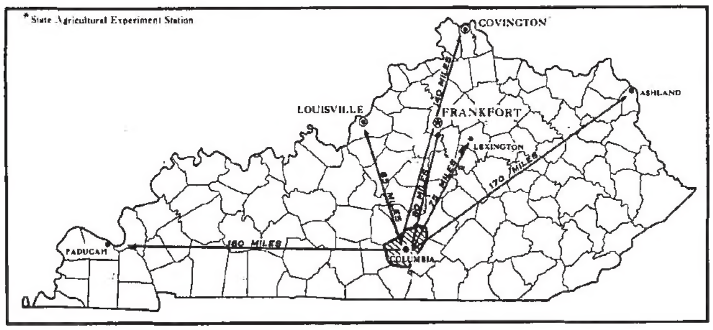

***Figure 1.*—Location of Adair County in Kentucky.**

This county is in the eastern Pennyroyal physiographic region of Kentucky, which is a part of the Mississippian Plateau (*10*).[2] The soils vary greatly. Most are acid and are low to moderate in natural fertility and in content of organic matter.

The climate is generally temperate and is well suited to a number of different plants. The summers are warm, and the winters are usually not severe. The average annual precipitation is about 49 inches. Fall is generally the driest season, and spring is the wettest.

The county is predominantly agricultural. The average-sized farm is 92.8 acres, but the size of the farms varies greatly. Corn is the most important feed crop, and tobacco is the most important cash crop. These crops are grown on most farms, along with hay crops and small grains. The raising of livestock is important in this county. In 1959, livestock and livestock products accounted for nearly 54 percent of the income derived from the sale of farm products. Approximately 43 percent of the total land area of the county is woodland.

General Soil Map

As one travels from place to place, he can see differences in the landscape. The traveler who enters Adair County from the east on Kentucky Highway No. 80 crosses an area where there are broad, nearly level ridgetops and moderately deep valleys between the ridges. As he nears Columbia, he notes that the topography is more rolling and that there are irregular slopes. As the traveler goes still farther west, he finds areas where the ridgetops and valleys are narrow, and the sides of the valleys are steep. He also can see related differences in the proportions of cultivated crops, pasture, and woodland; in the number of livestock; and in the improvements on the farms.

Each of the different areas contains a fairly definite pattern of soils. A group of geographically related soils that form a fairly definite pattern is called a soil association. The soils in any one association are likely to differ from each other in some or in many properties, for example, in slope, depth, stoniness, or natural drainage.

The general soil map at the back of the report shows five soil associations. In the following pages these associations are discussed and the major characteristics of the soils in each association are described. Also described are the position of the soils on the landscape and, briefly, their use, suitability, and management.

The general soil map is not large enough to show all the kinds of soils on a single farm. It can be used, however, to help in planning a community or an area in a county; in locating large areas suitable for a particular use; and in comparing soils in different areas.

1. Westmoreland-Caneyville-Baxter Association

Dominantly steep, well-drained or somewhat excessively drained soils that have a clayey subsoil and are on dissected uplands

Narrow, sloping ridgetops and narrow valleys that have steep walls are characteristic of this soil association (fig. 2). The soils on the steep walls of valleys, chiefly

[1] Most of this report is by FRED S. ARMS. E. A. OREN, woodland conservationist, and E. V. HUFFMAN, assistant State soil scientist, helped to write the section "Woodland Uses of Soils." The section on wildlife is by WILLIAM CASEY, biologist, SCS. The section on climate is by O. K. ANDERSON, State climatologist, U.S. Weather Bureau, Louisville, Ky. FRED S. ARMS and WILLIE R. PARTIN were party leaders at different times while the field survey was in progress.

[2] Italic numbers in parentheses refer to Literature Cited, p. 127.

the Westmoreland soils, are shallow over limestone and calcareous shale. The Caneyville soils occupy positions above and adjacent to the Westmoreland soils. They are moderately deep, well-drained, very rocky soils, and they have a red, clayey, plastic subsoil. The Baxter soils, which are cherty and deep over bedrock, are predominant on the ridgetops and on the upper parts of the valley walls. They are well drained and have a red, clayey subsoil.

Minor soils on the uplands in this association are the well drained Christian, Mountview, Bewleyville, Needmore, and Talbott soils and the moderately well drained Dickson and Sango soils. Minor soils on the foot slopes and in narrow strips along the streams are the well drained Humphreys, Huntington, and Staser soils, the moderately well drained Landisburg and Lindside soils, and the somewhat poorly drained Newark and Taft soils. Many of the soils of foot slopes and flood plains are gravelly, sandy, or cherty. The Humphreys soils are on most of the foot slopes, and the Landisburg soils are on some of the more gentle slopes. The Huntington, Staser, Lindside, and Newark soils occupy most of the first bottoms.

This association occupies about 28 percent of the county and extends along the southern and western boundaries. The Westmoreland soils make up about 30 percent of the association; the Caneyville soils, about 24 percent; and the Baxter soils, about 16 percent. The Christian soils are less extensive, but they make up about 11 percent of the association. Other minor soils make up the rest.

Most of the acreage on the ridgetops is in pasture or is used to grow corn, tobacco, small grains, and hay crops. The soils on the steep walls of the valleys are mainly in forests of hardwoods. A large part of the acreage of steep soils has been cultivated. The soils that are steep are severely eroded and are mainly idle, but some of the acreage is in pasture. Nearly all of the acreage in the valleys is in pasture or is used to grow corn, tobacco, small grains, and hay crops.

About 63 percent of this association remains in forest. About three-fifths of the cleared acreage is in hay and pasture, and nearly one-fifth is used for row crops. Most of the farms in this association are general farms and are operated by the owner.

About one-fourth of the acreage is suited to cultivated crops. The soils are generally productive of hay and pasture. Fair to good yields are obtained of tobacco, corn, and other row crops grown on the soils of the flood plains and on the gently sloping uplands.

Approximately 0.1 percent of the acreage in this association is in capability class I, 6 percent is in class II, 16 percent is in class III, 5 percent is in class IV, 15 percent is in class VI, and 57 percent is in class VII. Less than 0.1 percent is in class VIII.

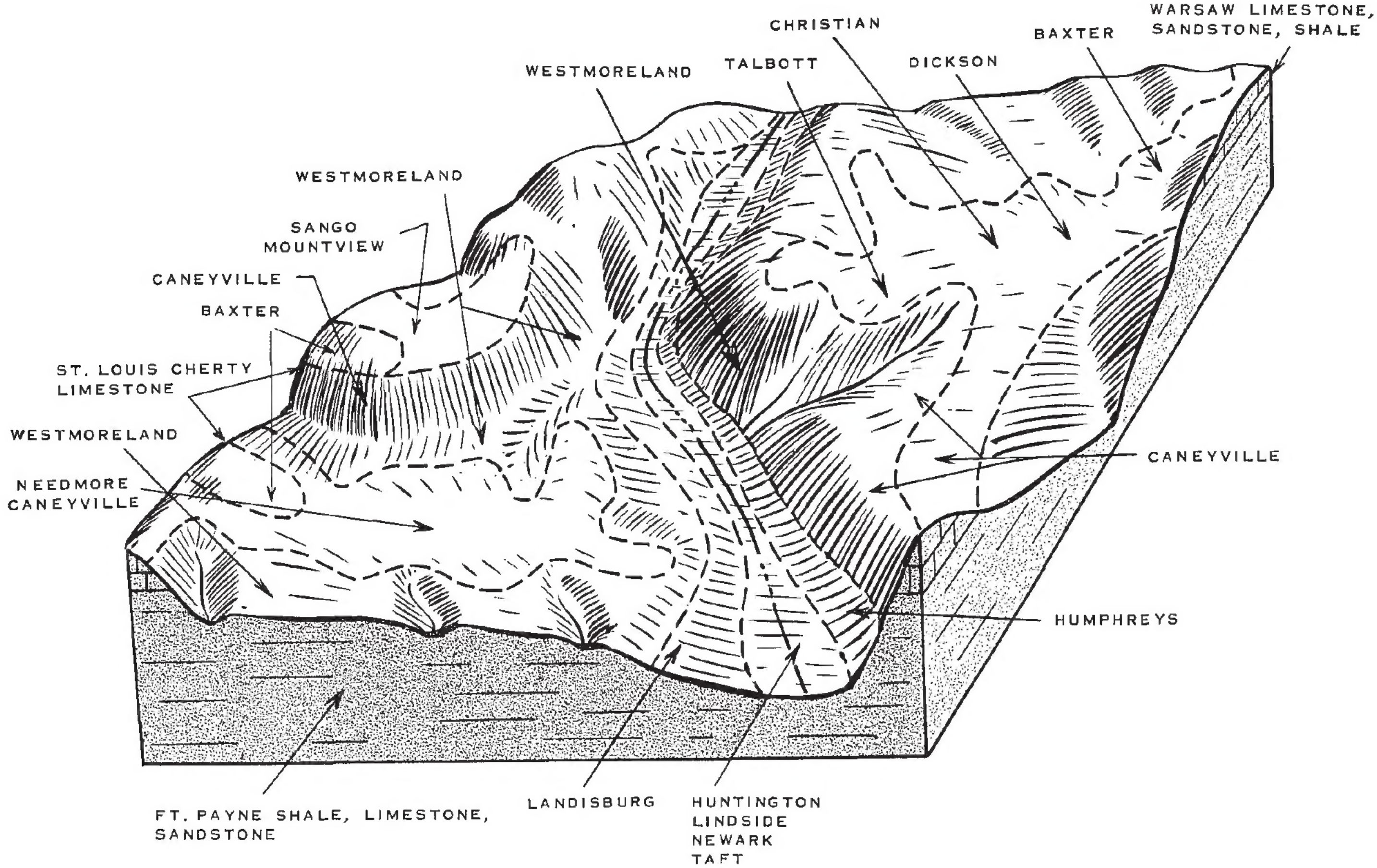

Figure 2.—**Diagram of the Westmoreland-Caneyville-Baxter association in Adair County.**

2. Baxter-Christian-Bewleyville Association

Rolling, dominantly well-drained soils that have a deep root zone and a clayey subsoil and are on broad uplands

The topography in this association is somewhat irregular (fig. 3). In many places there is karst topography that ranges from nearly level to steep. Sinkholes and depressions are common in places. Many of the creeks that flow through the county originate in this area. Russell Creek, the largest, flows from east to west. The soils in the areas along Russell Creek and its tributaries are among the most productive of all the soils of flood plains in this county.

The soils of the Baxter, Christian, and Bewleyville series are the most extensive soils in this association and are gently to strongly sloping. The Baxter soils formed in material weathered from cherty limestone. They have a red, clayey subsoil and have chert throughout their profile. The Christian soils formed in weathered products of mixed limestone, sandstone, and shale, and they contain more sand and less chert than the Baxter soils. The Bewleyville soils formed partly in loess and partly in the underlying material weathered from limestone. They have a yellowish-red subsoil of silty clay loam.

The Mountview, Cookeville, Dickson, Caneyville, Talbott, Westmoreland, Needmore, Pembroke, Frankstown, and Sango soils, all on uplands, are minor soils in the association. There is also a small acreage of soils on foot slopes, terraces, and flood plains that is important to agriculture. Generally, the well-drained Humphreys soils are on foot slopes. The moderately well drained Landisburg soils are also on foot slopes but are in seepy areas. The somewhat poorly drained Taft soils are on stream terraces, and the well drained Huntington and somewhat poorly drained Newark soils are on flood plains. Other minor soils are the well-drained Sequatchie, the somewhat poorly drained Whitwell, and the well drained or moderately well drained Wolftever soils on stream terraces, and the sandy, excessively drained Bruno, the moderately well drained Lindside, and the poorly drained Dunning soils of the flood plains.

This association occupies about 32 percent of the county. It extends in a northwesterly direction through Glens Fork, Columbia, and Cane Valley. The Baxter soils make

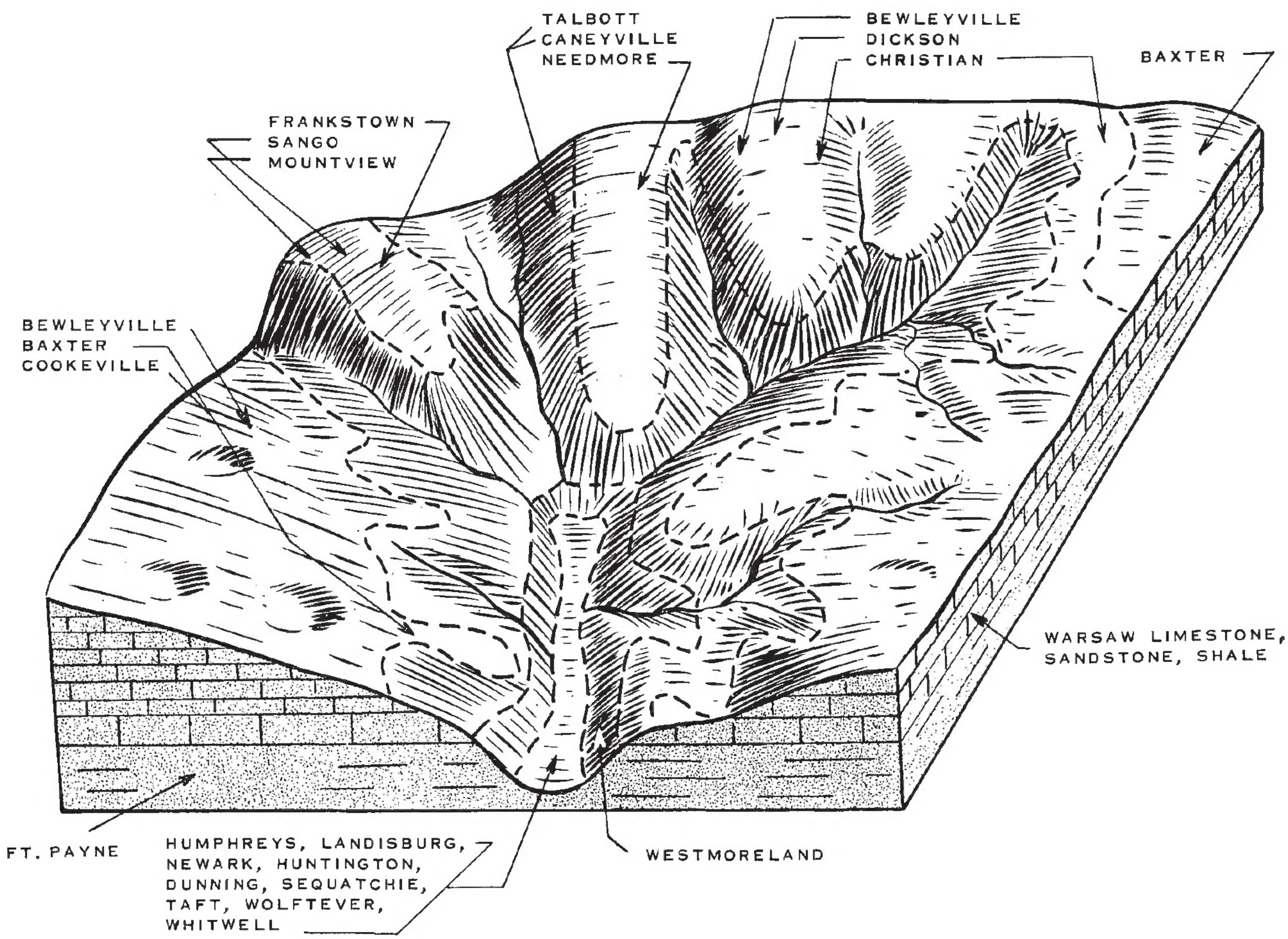

***Figure 3.*—Diagram of the Baxter-Christian-Bewleyville association.**

up about 30 percent of the association; the Christian soils, about 15 percent; and the Bewleyville soils, about 11 percent. Minor soils make up the rest of the acreage.

Only about 28 percent of this association is in trees, which are largely on the steeper slopes above creeks and in wooded areas on farms. A large part of the association is in hay and pasture or is used to grow corn, tobacco, and small grains. Nearly two-thirds of the acreage that has been cleared is used for hay and pasture. Most of the rest is used to grow row crops, although part is idle. General farms are predominant in the association. Large herds of dairy and beef cattle are on some of the farms.

About two-thirds of the acreage in this association is suited to cultivated crops. If the soils are well managed, good yields of corn, tobacco, small grains, hay crops, and pasture are obtained. The production of timber is of only minor importance, but there is a woodlot on most farms. The trees in the woodlots are mainly oaks and poplars.

Approximately 3 percent of the acreage in this association is in capability class I, 17 percent is in class II, 31 percent is in class III, 26 percent is in class IV, 14 percent is in class VI, and 8 percent is in class VII. Less than 0.1 percent is in class VIII.

3. Frankstown-Bodine-Westmoreland Association

Deep, sloping, well-drained, cherty soils on ridgetops, and shallow, steep, somewhat excessively drained or excessively drained soils on hillsides

Sloping ridgetops separated by narrow valleys that have steep walls make up most of this association (fig. 4). Some of the ridgetops are broad and are occupied mainly by Frankstown soils. Bodine and Westmoreland soils are extensive on the steep walls of the valleys.

The Frankstown soils are deep and well drained. They are cherty and have a subsoil of yellowish-brown silty clay loam. The Bodine soils are also cherty and are shallow and excessively drained. The Westmoreland soils lie below the Bodine soils. They are shallow over calcareous shale and contain partly weathered fragments of shale. The Westmoreland soils are almost neutral.

Minor soils on uplands in this association are the moderately well drained Dickson and Sango soils; the well drained Mountview, Christian, Bewleyville, and Cookeville soils; and the shallow, excessively drained Rock-

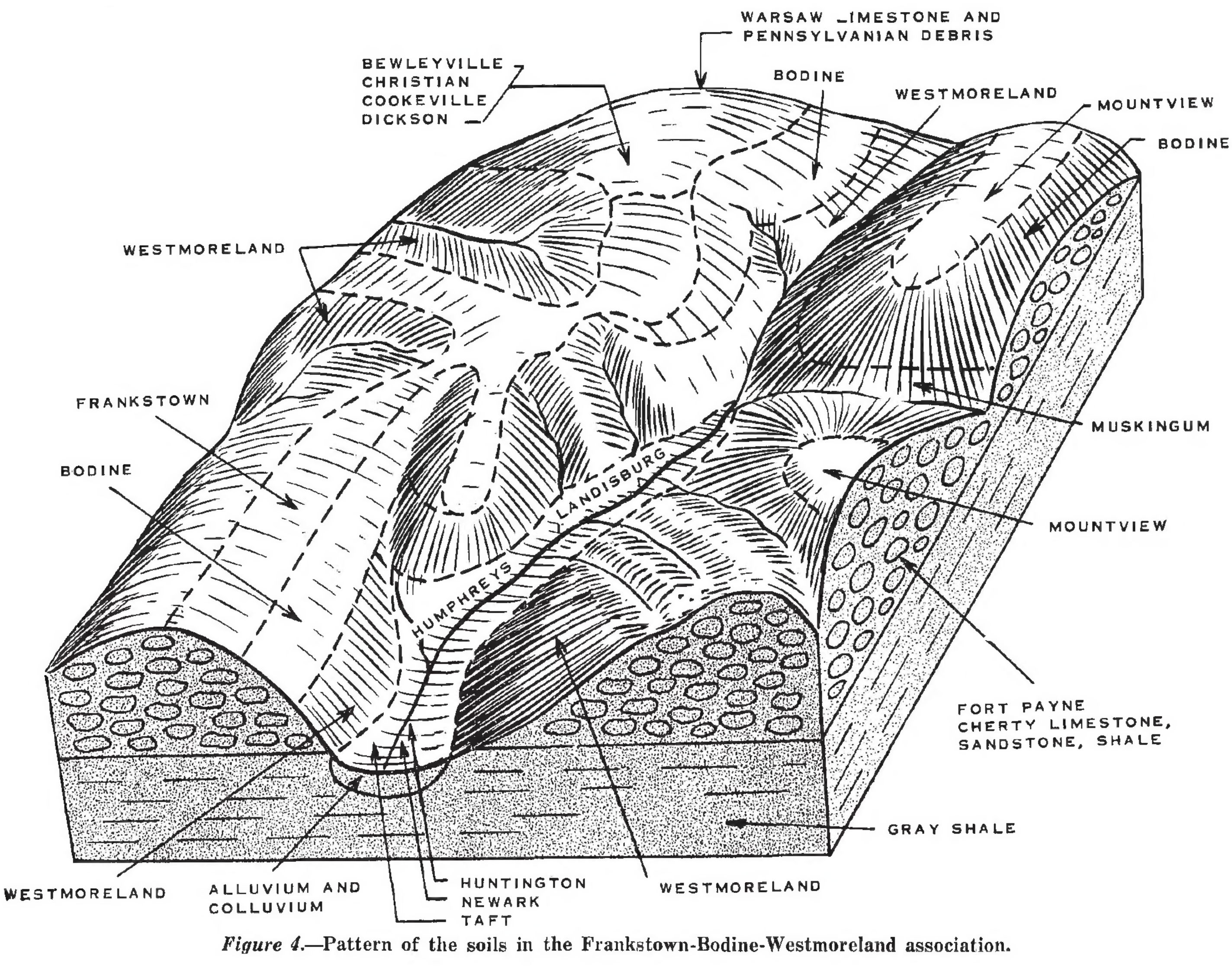

Figure 4.—Pattern of the soils in the Frankstown-Bodine-Westmoreland association.

castle and Muskingum soils. There is also a small acreage of Humphreys, Landisburg, Taft, Huntington, and Newark soils on foot slopes, stream terraces, and flood plains.

This association occupies about 26 percent of the county. The largest area extends from south of Green River northward to the boundaries of Taylor and Casey Counties. A smaller area, in the east-central part of the county extends along Big Clifty Creek to the Russell County line. The Frankstown soils make up about 29 percent of the association; the Bodine soils, 22 percent; and the Westmoreland soils, 21 percent. Minor soils make up the rest.

About 65 percent of the association, mainly the steep areas, remains in trees. Almost three-fourths of the acreage on the ridgetops has been cleared and is used chiefly for corn, tobacco, hay, and pasture. Approximately two-thirds of the acreage that has been cleared is used for hay and pasture, slightly more than one-fourth is used for row crops, and the rest is idle. Most of the farms in the association are general farms and are operated by the owner.

About half of the soils in this association are suited to cultivated crops, and fair to moderate yields of the commonly grown cultivated crops are obtained. Some of the soils contain chert that makes cultivation difficult. Moderate to good yields are obtained on well-managed areas used for hay and pasture.

Approximately 1 percent of the acreage in this association is in capability class I, 14 percent is in class II, 19 percent is in class III, 13 percent is in class IV, 21 percent is in class VI, and 31 percent is in class VII. Less than 0.1 percent is in class VIII.

4. Sango-Mountview-Lawrence Association

Soils of nearly level to sloping, broad ridgetops; somewhat poorly drained or moderately well drained soils that have a pan, and deep, well-drained soils

This association consists mainly of large flats and gentle slopes in the uplands (fig. 5). The somewhat poorly drained Lawrence soils and the moderately well drained Sango soils are dominant in the flat areas, and the well drained Mountview soils occupy the more sloping areas. The Mountview soils are practically free of the gray mottles that are typical of the Sango and Lawrence soils, and they lack a fragipan. The fragipan in the lower part of the subsoil in the Sango and Lawrence soils causes water

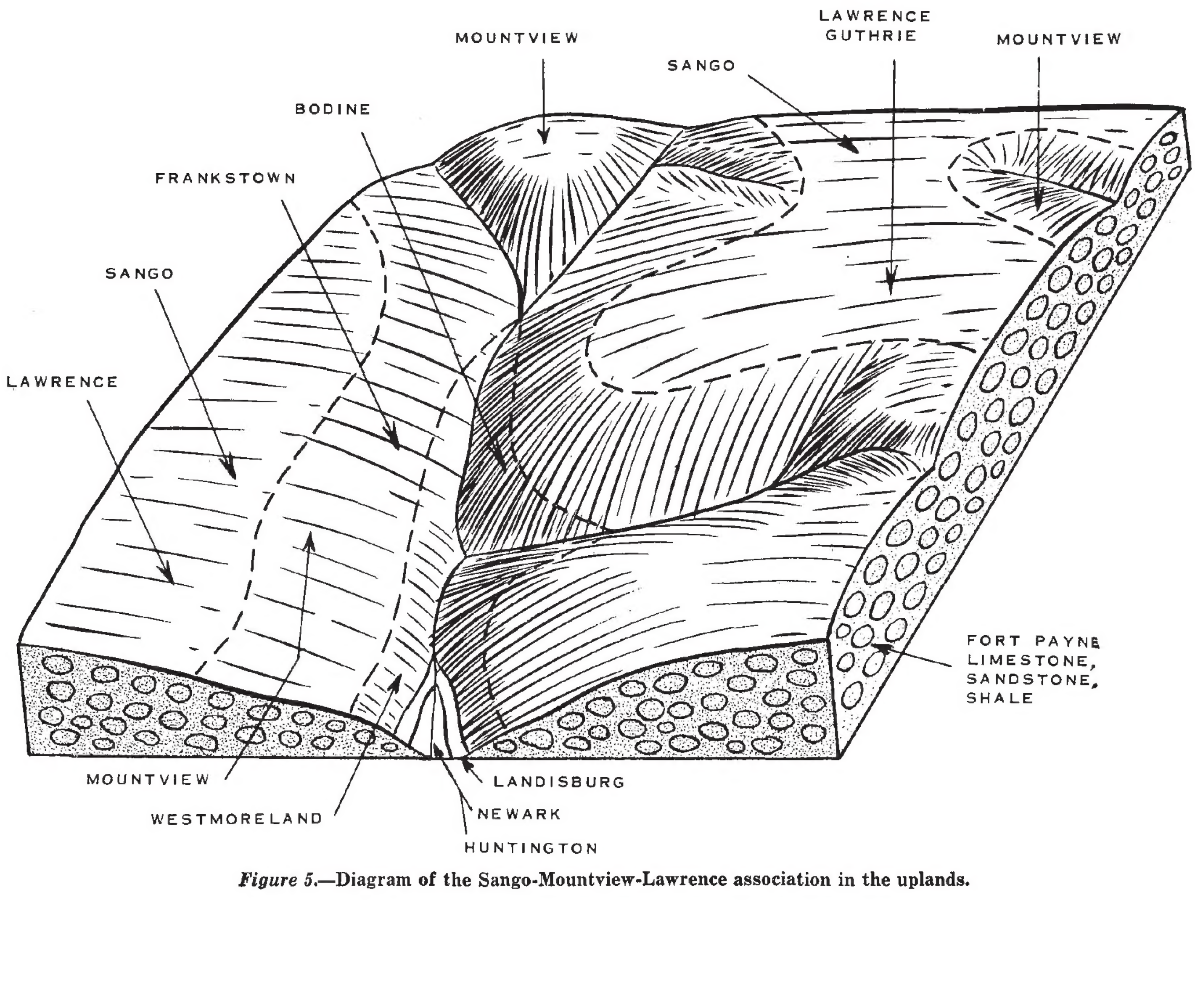

Figure 5.—**Diagram of the Sango-Mountview-Lawrence association in the uplands.**

to move slowly through the profile, and, as a result, these soils are wet in rainy seasons. The Sango, Mountview, and Lawrence soils formed partly in loess and partly in the underlying material weathered from cherty limestone. They are strongly acid.

Minor soils in this association are the cherty, well-drained Frankstown and cherty, excessively drained Bodine soils, the poorly drained Guthrie soils, and the steep Westmoreland soils. There is also a small acreage that consists mainly of Huntington, Newark, and Landisburg soils, which are on flood plains and foot slopes.

This association occupies about 8 percent of the county. One area is in the east-central part of the county and extends from Ozark and Purdy to the Russell County line. Another small area, known as the Flatwoods, is south of Columbia. The Sango soils make up about 32 percent of the association; the Mountview soils, 21 percent; and the Lawrence soils, 12 percent. The rest of the association consists of minor soils.

Except for the steep soils and the poorly drained or somewhat poorly drained soils on flats, most of this association has been cleared and is used chiefly for corn, tobacco, small grains, hay, and pasture. Approximately three-tenths of the cleared acreage is used for row crops, almost three-fifths is in pasture, and the rest is idle.

About 53 percent of the association is in trees. The wet flats and the steeper slopes are mostly in hardwoods, chiefly oak, gum, maple, poplar, and hickory. Most of the farms in this association are general farms and are operated by the owner.

Generally, only low to fair yields of the commonly grown crops are obtained on the soils in this association that are suitable for cultivation. The soils are generally strongly acid and are low in natural fertility. They are fairly easy to till, however, and they respond fairly well to lime and fertilizer. The somewhat poorly drained soils can be improved by surface drainage.

Approximately 0.1 percent of the acreage in this association is in capability class I, 31 percent is in class II, 30 percent is in class III, 18 percent is in class IV, 14 percent is in class VI, and 7 percent is in class VII. Less than 0.1 percent is in class VIII.

5. Staser-Taft-Landisburg Association

Somewhat poorly drained to well-drained soils on nearly level flood plains and on gently sloping to sloping stream terraces and foot slopes

This association is composed primarily of nearly level, well-drained soils of the flood plains; nearly level, somewhat poorly drained soils of the terraces; and nearly level to strongly sloping, moderately well drained soils of the foot slopes (fig. 6). The well-drained Staser soils, which

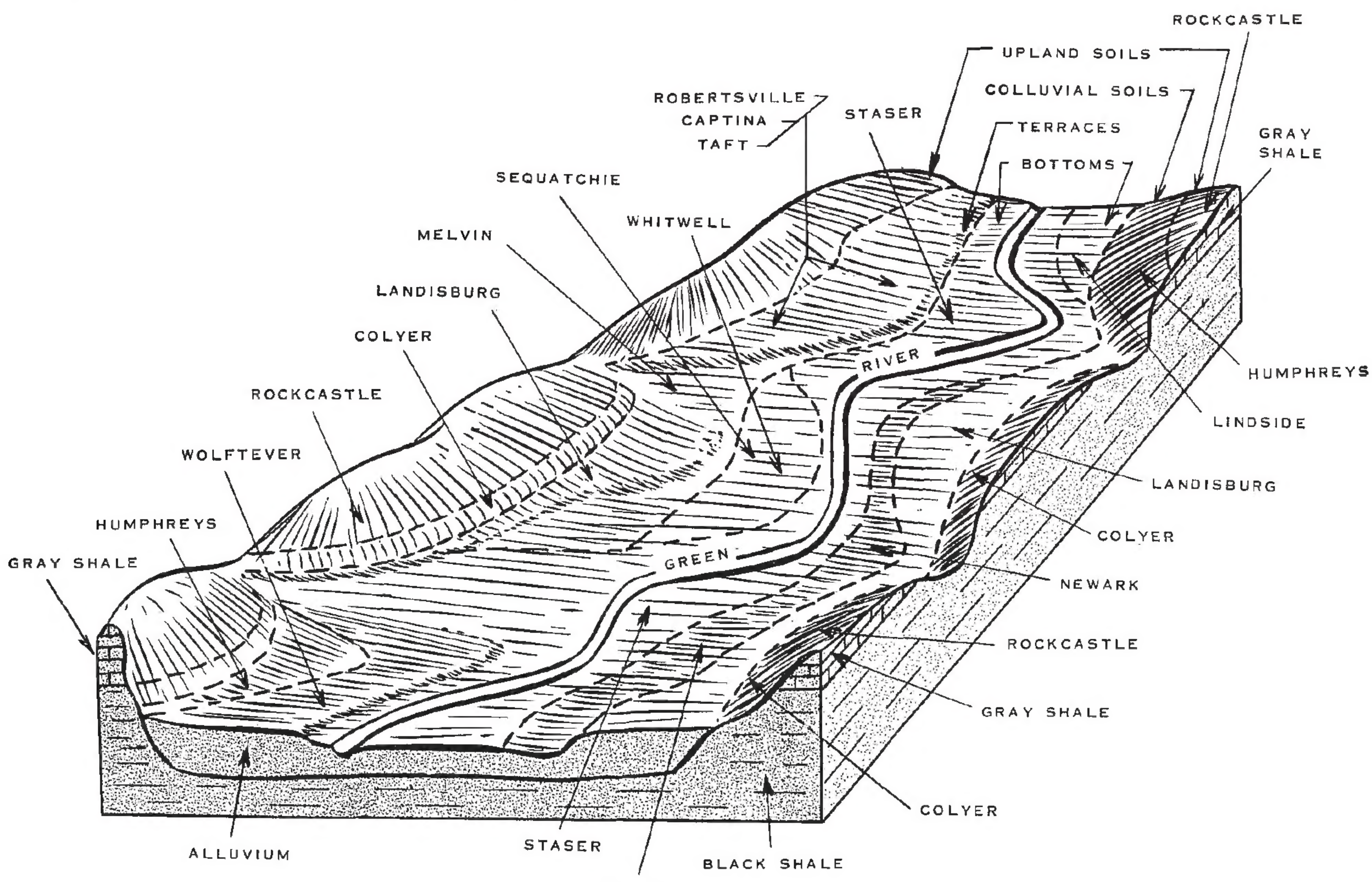

Figure 6.—**Diagram of the Staser-Taft-Landisburg association on flood plains, terraces, and foot slopes.**

have a surface layer of grayish-brown silt loam, loam, or gravelly loam, are dominant on the first bottoms. The somewhat poorly drained Taft soils are extensive on the stream terraces. The Taft soils have a surface layer of grayish-brown silt loam, and the lower part of their subsoil is mottled and compact. The moderately well drained Landisburg soils are on the nearly level to strongly sloping stream terraces and foot slopes. They have a surface layer of grayish-brown silt loam that is cherty in places. Their subsoil is light yellowish-brown silty clay loam to silt loam, and it has a compact pan in the lower part.

Excessively drained Rockcastle soils and somewhat excessively drained Colyer soils make up a minor part of this association. Minor soils of the flood plains are the well drained Huntington, the moderately well drained Lindside, the somewhat poorly drained Newark, and the poorly drained Melvin soils. Minor soils of the stream terraces include the well drained Sequatchie and Humphreys, the moderately well drained Captina, the moderately well drained or well drained Wolftever, the somewhat poorly drained Whitwell, and the poorly drained Robertsville soils. The well-drained Humphreys soils are also adjacent to the Landisburg soils on the foot slopes.

This association is along Green River and Casey Creek in the northern part of the county. It makes up about 6 percent of the total acreage in the county. About 28 percent of the association consists of Staser soils; about 16 percent, of Taft soils; and about 15 percent, of Landisburg soils. The rest of the association is occupied by minor soils.

The moderately well drained or well drained soils are used intensively to grow corn, and they make up one of the major corn-producing areas of the county. Tobacco, small grains, soybeans, and hay are also important crops. The more poorly drained areas are used mostly for pasture, but some of the acreage is in forests that consist mainly of sweetgum, water oak, red maple, beech, and sycamore.

Approximately 24 percent of this association is in trees. Almost half of the acreage that has been cleared is used for row crops, about 45 percent is used for hay and pasture, and the rest is idle. Most of the farms are general farms and are operated by the owner. Many good herds of beef cattle and dairy cattle are raised on the farms of the association, but swine are more commonly raised.

Almost all of the acreage in this association is suited to cultivated crops. In about 35 percent of the acreage, however, the soils are poorly drained or somewhat poorly drained and wetness is the major management problem. Many of the soils on the wet flood plains are in low areas or in depressions. Meandering streams and old sloughs that have silted in are common on the flood plains. Tile drainage is not feasible in many of the areas, because the soils have slow permeability or have too little slope. Some wet soils on the stream terraces can be improved by surface drainage. Drainage systems, however, generally involve two or more farms, and they, therefore, require a cooperative effort to establish them.

Approximately 17 percent of the acreage in this association is in capability class I, 29 percent is in class II, 24 percent is in class III, 21 percent is in class IV, 8 percent is in class VI, and 1 percent is in class VII.

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How Soils Are Named, Mapped, and Classified

Soil scientists made this survey to learn what kinds of soils are in Adair County, where they are located, and how they can be used.

They went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug or bored many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down to the rock material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to uniform procedures. To use this report efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Frankstown and Huntington, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in natural characteristics.

Many soil series contain soils that differ in the texture of their surface layer. According to such differences, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Huntington fine sandy loam and Huntington silt loam are two soil types in the Huntington series. The difference in the texture of their surface layer is apparent from their names.

Some soil types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into soil phases. The name of a soil phase indicates a feature that affects management. For example, Frankstown cherty silt loam, 2 to 6 percent slopes, is one of several phases of Frankstown cherty silt loam, a soil type that ranges from nearly level to strongly sloping.

After a fairly detailed guide for classifying and naming the soils had been worked out, the soil scientists drew soil boundaries on aerial photographs. They used photos for their base map because they show woodland, buildings, field borders, trees, and similar detail that greatly help in drawing boundaries accurately. The soil map in the back of this report was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not prac-

tical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientist has a problem of delineating areas where different kinds of soils are so intricately mixed, and so small in size, that it is not practical to show them separately on the map. Therefore, he shows this mixture of soils as one mapping unit and calls it a soil complex. Ordinarily, a soil complex is named for the major soil series in it, for example, Christian-Baxter cherty loams. Also, in most mapping, there are areas to be shown that are so rocky, so shallow, or so frequently worked by wind and water that they cannot be called soils. These areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Gullied land or Rock land, and are called land types rather than soils.

Descriptions of Soils

This section is provided for those who want information about the soils in the county. It describes the individual soils, or mapping units; that is, the areas on the detailed soil map that are bounded by lines and are identified by a symbol. For more general information about the soils, the reader can refer to the section "General Soil Map" in which the broad patterns of soils are described. A more detailed description of the soil series is given in the Section "Formation, Classification, and Morphology of Soils." The approximate acreage and proportionate extent of each soil mapped in the county are given in table 1. The location of the soils is shown on the soil map at the back of the report.

In the descriptions that follow, the soils in a series are first discussed as a group by describing important features that apply to all the soils in the series. Generally, the location of the soils is given, as well as their position on the landscape. Some of the nearby soils or similar soils are named, and their profile is compared to the typical profile described for the series. The general description of the series ends with a broad statement that tells how the soils are used.

The names of most of the soils give the texture of the surface layer, and many give the range in slope. The profile described under the first mapping unit is considered to be representative for all the soils in that series. The other soil descriptions generally tell how the profile of the soil described differs from the one given as representative of the series. These descriptions also tell something about the use and suitability of each soil and something about the management it needs. Definitions of terms used in this section are given in the Glossary.

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent
	Acres	*Percent*
Baxter cherty silt loam, 6 to 12 percent slopes	950	0.4
Baxter cherty silt loam, 2 to 6 percent slopes	754	.3
Baxter cherty silt loam, 6 to 12 percent slopes, eroded	7,682	3.1
Baxter cherty silt loam, 12 to 20 percent slopes	514	.2
Baxter cherty silt loam, 12 to 20 percent slopes, eroded	7,762	3.1
Baxter cherty silty clay loam, 12 to 20 percent slopes, severely eroded	533	.2
Baxter cherty silt loam, 20 to 30 percent slopes, eroded	5,626	2.2
Baxter cherty silty clay loam, 20 to 30 percent slopes, severely eroded	608	.2
Bewleyville silt loam, 2 to 6 percent slopes	2,469	1.0
Bewleyville silt loam, 6 to 12 percent slopes	1,587	.6
Bewleyville silt loam, 6 to 12 percent slopes, eroded	1,712	.7
Bodine cherty silt loam, 6 to 12 percent slopes	995	.4
Bodine cherty silt loam, 12 to 20 percent slopes	2,598	1.0
Bodine cherty silt loam, 20 to 30 percent slopes	9,503	3.8
Bodine cherty silt loam, 30 to 50 percent slopes	4,681	1.9
Bruno loamy fine sand	55	(1)
Caneyville very rocky soils, 20 to 30 percent slopes, eroded	5,086	2.0
Caneyville very rocky soils, 20 to 30 percent slopes, severely eroded	3,777	1.5
Caneyville very rocky soils, 30 to 45 percent slopes, eroded	5,926	2.4
Caneyville very rocky soils, 30 to 45 percent slopes, severely eroded	1,011	.4
Captina silt loam, 2 to 6 percent slopes	1,288	.5
Christian silt loam, 2 to 6 percent slopes	1,107	.4
Christian silt loam, 6 to 12 percent slopes	1,655	.7
Christian silt loam, 6 to 12 percent slopes, eroded	6,511	2.6
Christian silty clay loam, 6 to 12 percent slopes, severely eroded	310	.1
Christian silt loam, 12 to 20 percent slopes	383	0.2
Christian silt loam, 12 to 20 percent slopes, eroded	3,259	1.3
Christian silty clay loam, 12 to 20 percent slopes, severely eroded	1,529	.6
Christian fine sandy loam, 6 to 12 percent slopes, eroded	559	.2
Christian fine sandy loam, 12 to 20 percent slopes, eroded	261	.1
Christian very rocky soils, 8 to 20 percent slopes, eroded	3,917	1.6
Christian very rocky soils, 12 to 20 percent slopes, severely eroded	1,350	.5
Christian-Baxter cherty loams, 6 to 12 percent slopes, eroded	764	.3
Christian-Baxter cherty loams, 12 to 20 percent slopes, eroded	1,248	.5
Christian-Baxter cherty loams, 20 to 30 percent slopes, eroded	538	.2
Christian-Baxter cherty loams, 20 to 30 percent slopes, severely eroded	394	.2
Colyer shaly silt loam, 12 to 30 percent slopes	741	.3
Cookeville silt loam, 6 to 12 percent slopes, eroded	1,110	.4
Dickson silt loam, 2 to 6 percent slopes	3,731	1.5
Dunning silt loam	230	.1
Etowah silt loam, 2 to 6 percent slopes	201	.1
Etowah silt loam, 6 to 12 percent slopes	223	.1
Frankstown cherty silt loam, 6 to 12 percent slopes	5,121	2.0
Frankstown cherty silt loam, 2 to 6 percent slopes	1,344	.5
Frankstown cherty silt loam, 6 to 12 percent slopes, eroded	4,889	1.9
Frankstown cherty silt loam, 12 to 20 percent slopes	2,357	.9

[1] Less than 0.1 percent.

TABLE 1.—*Approximate acreage and proportionate extent of the soils*—Continued

Soil	Area	Extent
	Acres	*Percent*
Frankstown cherty silt loam, 12 to 20 percent slopes, eroded	6, 156	2. 4
Gullied land	1, 199	. 5
Guthrie silt loam	266	. 1
Humphreys cherty silt loam, 2 to 6 percent slopes	1, 014	. 4
Humphreys cherty silt loam, 6 to 12 percent slopes	2, 418	1. 0
Humphreys cherty silt loam, 6 to 12 percent slopes, eroded	2, 888	1. 2
Humphreys cherty silt loam, 12 to 20 percent slopes, eroded	1, 704	. 7
Humphreys cherty silt loam, shallow, 12 to 20 percent slopes, eroded	313	. 1
Humphreys cherty silt loam, 20 to 30 percent slopes	558	. 2
Humphreys cherty silt loam, 20 to 30 percent slopes, eroded	1, 003	. 4
Humphreys silt loam, 6 to 12 percent slopes	264	. 1
Huntington silt loam	2, 330	. 9
Huntington fine sandy loam	507	. 2
Huntington gravelly loam	1, 699	. 7
Landisburg cherty silt loam, 6 to 12 percent slopes	582	. 2
Landisburg cherty silt loam, 0 to 2 percent slopes	322	. 1
Landisburg cherty silt loam, 2 to 6 percent slopes	1, 675	. 7
Landisburg cherty silt loam, 6 to 12 percent slopes, eroded	826	. 3
Landisburg cherty silt loam, 12 to 20 percent slopes, eroded	494	. 2
Landisburg silt loam, 0 to 2 percent slopes	401	. 2
Landisburg silt loam, 2 to 6 percent slopes	2, 055	. 8
Landisburg silt loam, 6 to 12 percent slopes	372	. 1
Landisburg silt loam, 6 to 12 percent slopes, eroded	601	. 2
Lawrence silt loam	2, 254	. 9
Lindside silt loam	1, 955	. 8
Melvin silt loam	522	. 2
Mountview silt loam, 6 to 12 percent slopes	3, 388	1. 3
Mountview silt loam, 2 to 6 percent slopes	3, 397	1. 4
Mountview silt loam, 6 to 12 percent slopes, eroded	4, 122	1. 6
Mountview silt loam, shallow, 2 to 6 percent slopes	669	. 3
Mountview silt loam, shallow, 6 to 12 percent slopes	777	. 3
Mountview silt loam, shallow, 6 to 12 percent slopes, eroded	1, 311	. 5
Mountview silt loam, shallow, 12 to 20 percent slopes	368	. 1
Mountview silt loam, shallow, 12 to 20 percent slopes, eroded	602	. 2
Muskingum very fine sandy loam, 18 to 30 percent slopes	954	. 4
Needmore silt loam, 6 to 12 percent slopes	296	0. 1
Needmore silt loam, 2 to 6 percent slopes	275	. 1
Needmore silty clay loam, 2 to 6 percent slopes, eroded	137	. 1
Needmore silty clay loam, 6 to 12 percent slopes, eroded	1, 594	. 6
Needmore silty clay loam, 12 to 20 percent slopes, eroded	911	. 4
Needmore silty clay, 8 to 20 percent slopes, severely eroded	177	. 1
Newark silt loam	2, 032	. 8
Newark gravelly silt loam	1, 883	. 8
Pembroke silt loam, 2 to 6 percent slopes	485	. 2
Pembroke silt loam, 6 to 12 percent slopes	470	. 2
Robertsville silt loam	2, 405	1. 0
Rockcastle silt loam, 20 to 30 percent slopes	792	. 3
Rockcastle silt loam, 12 to 20 percent slopes	517	. 2
Rockcastle silt loam, 30 to 40 percent slopes	703	. 3
Rock land	698	. 3
Rock outcrop	335	. 1
Sango silt loam, 0 to 2 percent slopes	657	. 3
Sango silt loam, 2 to 6 percent slopes	9, 507	3. 8
Sequatchie silt loam, 0 to 4 percent slopes	431	. 2
Staser silt loam	3, 285	1. 3
Staser loam	931	. 4
Staser gravelly loam	2, 824	1. 1
Taft silt loam	4, 234	1. 7
Talbott silt loam, 6 to 12 percent slopes, eroded	1, 107	. 4
Talbott very rocky silt loam, 12 to 20 percent slopes, eroded	1, 718	. 7
Talbott very rocky silty clay, 12 to 20 percent slopes, severely eroded	553	. 2
Talbott very rocky silt loam, 20 to 30 percent slopes, eroded	596	. 2
Talbott very rocky silty clay, 20 to 30 percent slopes, severely eroded	596	. 2
Westmoreland shaly silt loam, 12 to 20 percent slopes	4, 754	1. 9
Westmoreland shaly silt loam, 2 to 6 percent slopes	811	. 3
Westmoreland shaly silt loam, 6 to 12 percent slopes	5, 232	2. 1
Westmoreland shaly silt loam, 20 to 30 percent slopes	5, 983	2. 4
Westmoreland shaly silt loam, 30 to 55 percent slopes	26, 582	10. 6
Westmoreland shaly silty clay loam, 12 to 30 percent slopes, severely eroded	5, 097	2. 0
Westmoreland shaly silty clay loam, 30 to 50 percent slopes, severely eroded	2, 182	. 9
Whitwell silt loam	455	. 2
Wolftever silt loam	566	. 2
City of Columbia	894	. 4
Total	251, 520	100. 0

Baxter Series

The Baxter series consists of well-drained, cherty soils that have a red, clayey subsoil and are medium acid. The soils developed in material weathered from cherty limestone. They are gently sloping to moderately steep. In places they are in areas of karst topography.

These soils occur with Dickson, Westmoreland, Cookeville, or Christian soils. Their surface layer is more brownish than that of the Dickson soils, and their subsoil is more reddish. They also contain more chert and lack the pan that is typical in the Dickson soils. The Baxter soils are deeper and have a more strongly developed profile than the Westmoreland soils, and they are underlain by cherty limestone rather than by calcareous shale. The Baxter soils are somewhat similar to the Cookeville soils, but they have fragments of chert on the surface and throughout the profile. They are more cherty and less sandy than the Christian soils.

The Baxter soils occur throughout most of the county. Most of the acreage has been cleared, and the nearly level to rolling areas are used mainly for cultivated crops. The steep areas are used for pasture and forest.

Baxter cherty silt loam, 6 to 12 percent slopes (BaC).—This is a well-drained, medium acid soil of the uplands. It has a surface layer of grayish-brown cherty silt loam and a red, firm, clayey subsoil. The subsoil contains chert. The following describes a typical profile:

0 to 9 inches, grayish-brown, friable cherty silt loam that grades to reddish yellow in the lower part.
9 to 14 inches, yellowish-red, friable cherty silty clay loam.
14 to 34 inches, red, firm cherty silty clay that has blocky structure.
34 to 48 inches, red, firm cherty clay that contains pockets of sand; strong, blocky structure.
48 inches +, red, light-gray, and pale-yellow, firm cherty clay that has blocky structure; the content of chert and sand increases with increasing depth.

In places the surface layer is dark brown. The subsurface layer is clay in some places. The depth to chert and the amount of chert in the profile vary.

This soil has medium runoff. The hazard of erosion is moderate. The root zone is deep, and the soil is high in moisture-supplying capacity. It is moderately permeable, moderate in natural fertility, and medium in content of organic matter.

The fragments of chert interfere, to some extent, with the use of tillage implements. Most of the acreage, however, is used for cultivated crops. (Capability unit IIIe-6; woodland suitability group 1; wildlife productivity group 2.)

Baxter cherty silt loam, 2 to 6 percent slopes (BaB).—The solum of this soil is slightly thicker than that of Baxter cherty silt loam, 6 to 12 percent slopes. Surface runoff is medium to slow, and the hazard of erosion is moderately low. (Capability unit IIe-11; woodland suitability group 1; wildlife productivity group 2.)

Baxter cherty silt loam, 6 to 12 percent slopes, eroded (BaC2).—The surface layer of this soil generally consists of a mixture of material from the original surface layer and from the red, clayey subsoil. In some places the present surface layer consists of red, clayey material that was formerly part of the subsoil.

The profile of this soil is similar to that of Baxter cherty silt loam, 6 to 12 percent slopes, but in places this soil has only a moderately deep root zone. It is moderately high in moisture-supplying capacity and is low in content of organic matter.

Mapped with this soil is approximately 88 acres of Baxter cherty silty clay loam, 6 to 12 percent slopes, severely eroded. In these areas the present surface layer consists primarily of red, clayey soil material that was formerly part of the subsoil. (Capability unit IIIe-6; woodland suitability group 1; wildlife productivity group 2.)

Baxter cherty silt loam, 12 to 20 percent slopes (BaD).—This strongly sloping soil has medium to rapid runoff. The hazard of erosion is moderately severe. (Capability unit IVe-3; woodland suitability group 2; wildlife productivity group 2.)

Baxter cherty silt loam, 12 to 20 percent slopes, eroded (BaD2).—In most places the present surface layer of this soil consists of a mixture of material from the original surface layer and from the red, clayey subsoil. In some places all of the present surface layer consists of material that was formerly part of the subsoil. The soil has a moderately deep root zone. Runoff is rapid, and the hazard of further erosion is moderately severe. The content of organic matter is low. (Capability unit IVe-3; woodland suitability group 2; wildlife productivity group 2.)

Baxter cherty silty clay loam, 12 to 20 percent slopes, severely eroded (BcD3).—The surface layer of this soil consists primarily of red, clayey soil material that was originally part of the subsoil. This clayey material makes the soil difficult to work.

The profile of this soil is similar to that of Baxter cherty silt loam, 6 to 12 percent slopes, but this soil has only a moderately deep root zone. It is low in moisture-supplying capacity, low in content of organic matter, and moderately low in natural fertility. Runoff is rapid. The hazard of further erosion is severe. (Capability unit VIe-2; woodland suitability group 6; wildlife productivity group 3.)

Baxter cherty silt loam, 20 to 30 percent slopes, eroded (BaE2).—In most places the surface layer of this soil consists of a mixture of material from the original surface layer and from the red, clayey subsoil. In some places the present surface layer consists of red, clayey soil material that was formerly part of the subsoil.

This soil is moderately high in moisture-supplying capacity and has a moderately deep root zone. It is low in content of organic matter. Runoff is rapid, and the hazard of further erosion is severe.

Mapped with this soil is approximately 608 acres of Baxter cherty silt loam, 20 to 30 percent slopes. These included areas are mainly in trees and show little or no evidence of erosion. (Capability unit VIe-1; woodland suitability group 2; wildlife productivity group 2.)

Baxter cherty silty clay loam, 20 to 30 percent slopes, severely eroded (BcE3).—The surface layer of this soil consists primarily of red, clayey material that was originally part of the subsoil. This clayey material makes the soil difficult to work.

The profile of this soil is similar to that of Baxter cherty silt loam, 6 to 12 percent slopes, but this soil has only a moderately deep root zone. It is low in moisture-supplying capacity, low in content of organic matter, and moderately low in natural fertility. Runoff is very rapid. The hazard of further erosion is severe. (Capability unit VIIe-1; woodland suitabiilty group 6; wildlife productivity group 3.)

Bewleyville Series

The Bewleyville series consists of deep, well-drained soils that are medium or strongly acid. The surface layer of these soils is brown silt loam, and the upper part of their subsoil is reddish-brown to yellowish-red silty clay loam. The soils developed partly in a thin mantle of silty material and partly in material weathered from limestone. They are gently sloping or sloping and are on the uplands.

These soils are near the Mountview, Dickson, Baxter, and Cookeville soils. Their subsoil is more brownish or more reddish than that of the Mountview soils, and they are much more productive of the crops that are commonly grown. They lack the fragipan and mottling that is typical of the Dickson soils, and they are better drained. The lower part of their subsoil is more reddish and contains more clay than that of the Dickson soils. The upper part of their subsoil is more brownish than that of the Baxter

and Cookeville soils, and the upper part of their solum developed in silty material rather than in material weathered mainly from limestone. The Bewleyville soils are somewhat similar to the Pembroke soils, but they developed in a thicker mantle of silt. Their surface layer is lighter colored than that of the Pembroke soils, the upper part of their subsoil is more brownish and less reddish, and the lower part of their subsoil is more yellowish and less reddish.

Most of the acreage of Bewleyville soils has been cleared and is used for cultivated crops. Good yields are obtained of corn, burley tobacco, hay, small grains, and other general farm crops.

Bewleyville silt loam, 2 to 6 percent slopes (BeB).—This soil is deep, well drained, and fertile. The following describes a typical profile:

0 to 11 inches, brown, friable silt loam.
11 to 17 inches, strong-brown, firm light silty clay loam that has moderate, blocky structure.
17 to 29 inches, yellowish-red, firm silty clay loam that has moderate, blocky structure.
29 inches +, dark-red to yellowish-red, firm silty clay that has streaks and splotches of light yellowish brown and olive gray.

This soil has slow to medium runoff, a deep root zone, and very high moisture-supplying capacity. It is medium in content of organic matter and moderate in permeability. This soil is moderately high in natural fertility and is easy to work. The hazard of erosion is moderately low.

Mapped with this soil are a few areas that are eroded, a few areas that contain silty clay in the upper part of their subsoil, and a small acreage of an uneroded Cookeville silt loam and of an eroded Cookeville silt loam. (Capability unit IIe-1; woodland suitability group 1; wildlife productivity group 1.)

Bewleyville silt loam, 6 to 12 percent slopes (BeC).—The profile of this soil is similar to that of Bewleyville silt loam, 2 to 6 percent slopes, but this soil has medium runoff. The hazard of erosion is moderate.

Mapped with this soil are areas of a soil that contains silty clay in the upper part of its subsoil. (Capability unit IIIe-1; woodland suitability group 1; wildlife productivity group 1.)

Bewleyville silt loam, 6 to 12 percent slopes, eroded (BeC2).—In most places the present surface layer of this soil consists of a mixture of material from the original surface layer and from the subsoil. In some places all of the present surface layer consists of reddish, firm silty clay loam that was formerly part of the subsoil. This soil has medium runoff, and it is low in content of organic matter. The hazard of further erosion is moderate. (Capability unit IIIe-1; woodland suitability group 1; wildlife productivity group 1.)

Bodine Series

The Bodine series consists of excessively drained, cherty soils of the uplands. The soils are strongly acid. Their surface layer is grayish-brown cherty silt loam, and their subsoil is yellowish-brown cherty silty clay loam. The soils developed in material weathered from very cherty limestone. They are sloping to steep.

The Bodine soils occur near the Mountview, Frankstown, and Westmoreland soils. Their profile is thinner and less well developed than those of the Mountview and Frankstown soils, and they are cherty and developed primarily in material weathered from cherty limestone. The Bodine soils are more strongly acid and are more cherty than the Westmoreland soils.

Most areas of these soils have been cleared, but because the soils are droughty and low in productivity, much of the acreage is now idle. Even under good management, only low yields of corn, hay, burley tobacco, and pasture are obtained.

Bodine cherty silt loam, 6 to 12 percent slopes (BoC).—This is an excessively drained, cherty soil. It is strongly acid. The following describes a typical profile:

0 to 6 inches, dark grayish-brown, friable cherty silt loam.
6 to 18 inches, yellowish-brown cherty silty clay loam that has weak, blocky structure.
18 inches +, primarily a chert bed with some light yellowish-brown, strong-brown, and reddish-brown silty clay loam material.

This soil contains little organic matter and is low in natural fertility. It is moderately low in moisture-supplying capacity. The root zone is moderately deep, and runoff is medium. The hazard of erosion is moderate. The workability of this soil is slightly affected by the high content of chert.

Mapped with this soil are several acres of eroded soils in which the surface layer is a mixture of material from the original surface layer and the subsoil. (Capability unit IVs-2; woodland suitability group 3; wildlife productivity group 3.)

Bodine cherty silt loam, 12 to 20 percent slopes (BoD).—Approximately one-half of the acreage of this soil shows some signs of erosion. In the eroded areas the original surface layer is thinner than that in other areas. The present surface layer in places consists of a mixture of material from the original surface layer and from the subsoil. The soil has rapid runoff, and the hazard of erosion is moderately severe. (Capability unit VIs-3; woodland suitability group 3; wildlife productivity group 3.)

Bodine cherty silt loam, 20 to 30 percent slopes (BoE).—The profile of this soil is similar to that of Bodine cherty silt loam, 6 to 12 percent slopes, but it is shallower over chert beds and the surface layer is thinner. Approximately one-half of the acreage shows some signs of erosion. In these eroded areas the original surface layer is thinner than that in the other areas. Also, in these eroded areas, the present surface layer in places consists of a mixture of material from the original surface layer and from the subsoil. This soil has rapid runoff, and the hazard of erosion is severe. (Capability unit VIIs-1; woodland suitability group 3; wildlife productivity group 3.)

Bodine cherty silt loam, 30 to 50 percent slopes (BoF).—The profile of this soil is similar to that of Bodine cherty silt loam, 6 to 12 percent slopes, but it is shallower over chert beds and the surface layer is thinner. Runoff is very rapid, and the hazard of erosion is severe. Only a small acreage of this soil has been cleared.

Mapped with this soil are a few areas of eroded soils. (Capability unit VIIs-1; woodland suitability group 3; wildlife productivity group 3.)

Bruno Series

The Bruno series consists of deep, excessively drained, medium or strongly acid soils of the first bottoms. These soils have a surface layer of dark grayish-brown loamy fine sand and a subsoil of dark grayish-brown loamy sand. The subsoil overlies stratified sandy and gravelly alluvium. The soils developed in alluvium washed from soils of siltstone and sandstone origin.

The Bruno soils are along the large streams. In places they are near the Huntington and Newark soils. They are more sandy and are more strongly acid than the Huntington and Newark soils, and they are better drained than the Newark soils.

These soils have been cleared and are used mainly to grow corn. Under good management, yields are low to fair.

Bruno loamy fine sand (Br).—This is the only Bruno soil mapped in the county. It is sandy, excessively drained, and medium or strongly acid. This soil is on nearly level first bottoms. The following describes a typical profile:

0 to 9 inches, dark grayish-brown, loose loamy fine sand.
9 to 28 inches, dark grayish-brown, very loose loamy sand.
28 to 40 inches +, light-gray, sandy and gravelly alluvium.

This soil is low in content of organic matter, moderately low in moisture-supplying capacity, and moderately low in natural fertility. It has rapid permeability. Runoff is slow and internal drainage is rapid. The hazard of flooding is severe.

All of this soil has been cleared; most of it is used to grow corn, but, even under good management, yields are only low to fair. (Capability unit IIIs–1; woodland suitability group 11; wildlife productivity group 2.)

Caneyville Series

The soils of the Caneyville series are well drained or somewhat excessively drained and are moderately deep over bedrock. In most places the surface layer is silt loam, but its texture ranges to loam or fine sandy loam. The subsoil is red and clayey; the amount of sand it contains varies from place to place. The parent material weathered mainly from limestone and sandstone, but in places it contains some material from shale. Outcrops of limestone are common.

The Caneyville soils occur in the southern and western parts of the county. They occupy steep areas near the Talbott and Westmoreland soils and are on gently sloping ridgetops below the Christian soils. Their profile is more sandy than that of the Talbott soils, and their subsoil is less plastic. The Caneyville soils are deeper over bedrock than the Westmoreland soils, and their subsoil is more reddish. Their profile is also more strongly developed and more strongly acid than that of the Westmoreland soils. The Caneyville soils are shallower over bedrock than the Christian soils, and they have a less strongly developed subsoil.

The Caneyville soils were orginally covered by a forest of hardwoods, but most of the acreage has been cleared. The areas that have been cultivated are susceptible to erosion. Most of the acreage is now idle or in pasture. Because of the common rock outcrops and the clayey texture of the present surface layer, the use of these soils is limited mainly to growing of trees or pasture.

Caneyville very rocky soils, 20 to 30 percent slopes, eroded (CaE2).—This mapping unit consists of moderately steep, well-drained or somewhat excessively drained soils that are moderately deep over limestone. The following describes a typical profile of a Caneyville very rocky silt loam:

0 to 6 inches, dark yellowish-brown very rocky silt loam.
6 to 25 inches, yellowish-red, firm and somewhat stiff silty clay to clay that has blocky structure.
25 to 35 inches, variegated yellowish-red and browish-yellow, very plastic clay.
35 inches +, limestone.

In most places the surface layer is silt loam, but in places it is loam or fine sandy loam. The color of the subsoil ranges from yellowish red to strong brown. The amount of sand varies throughout the profile, and in places the subsoil is sandy clay. Depth to bedrock ranges from 2 to 6 feet. In most places there are a few fragments of sandstone and chert on and in these soils. Creep occurs in some places.

These soils are moderately low in natural fertility and are low in content of organic matter. They are medium or strongly acid. Runoff is rapid and permeability is moderately slow. The soils have a moderately deep root zone and low available moisture-supplying capacity. The hazard of further erosion is severe. The steep slopes and numerous rock outcrops limit the use of farm machinery.

Because of the steep slopes, severe hazard of further erosion, and the many rocks, these soils are not suited to cultivated crops. The amount of forage that is produced for grazing is limited, and the soils are better suited to trees. Most of the acreage has been cultivated, but much of it is now idle or in low-quality pasture. (Capability unit VIIs–2; woodland suitability group 2; wildlife productivity group 3.)

Caneyville very rocky soils, 20 to 30 percent slopes, severely eroded (CaE3).—The profile of these soils is similar to that of Caneyville very rocky soils, 20 to 30 percent slopes, eroded, but the surface layer is thinner and finer textured. In many places the present surface layer is red, clayey material from the original subsoil. Runoff is very rapid, the available moisture-supplying capacity is very low, and the root zone is shallow.

Mapped with these soils are several very small areas of Gullied land and 72 acres of Baxter very rocky silty clay loam, severely eroded. (Capability unit VIIs–2; woodland suitability group 7; wildlife productivity group 3.)

Caneyville very rocky soils, 30 to 45 percent slopes, eroded (CaF2).—The profile of these soils is similar to that of Caneyville very rocky soils, 20 to 30 percent slopes, eroded, but these soils are steeper and shallower over bedrock. Runoff is very rapid, and the hazard of further erosion is severe. (Capability unit VIIs–2; woodland suitability group 2; wildlife productivity group 3.)

Caneyville very rocky soils, 30 to 45 percent slopes, severely eroded (CaF3).—In many places the present surface layer of these soils consists of red, clayey material that was formerly part of the subsoil. These soils have rapid runoff and a shallow root zone. The hazard of further erosion is severe. (Capability unit VIIs–2; woodland suitability group 7; wildlife productivity group 3.)

Captina Series

The Captina series consists of moderately well drained soils that are medium or strongly acid. The surface layer is dark grayish-brown silt loam; the subsoil is yellowish-brown silty clay loam. A fragipan, which restricts the movement of water through the subsoil, occurs at a depth of 20 to 30 inches. These soils developed in alluvium washed from soils primarily of limestone origin but that contain a mixture of materials from shale and sandstone.

The Captina soils occur on nearly level to sloping terraces near the Taft, Robertsville, Humphreys, and Landisburg soils. Their surface layer is more brownish than that of the Taft and Robertsville soils, and their subsoil is more yellowish and less mottled. They are also less acid than the Taft and Robertsville soils and are better drained and more productive. The Captina soils have a surface layer that is more grayish than that of the Humphreys soils, and they contain less chert and gravel and have a fragipan. The Captina soils are similar to the Landisburg soils in drainage, but they are darker and less grayish throughout.

The Captina soils are moderately important to agriculture. Most of the acreage is used for crops.

Captina silt loam, 2 to 6 percent slopes (CbB).—This is the only Captina soil mapped in the county. It is moderately well drained and is on stream terraces. A firm, compact layer, or fragipan, which limits the movement of water through the soil, is at a depth of 20 to 30 inches. The following describes a typical profile:

0 to 12 inches, dark grayish-brown, friable silt loam that changes to yellowish brown in the lower part.
12 to 26 inches, yellowish-brown, firm silty clay loam; a few variegations of strong brown and pale olive; moderate, blocky structure.
26 to 36 inches, yellowish-brown pan of firm, compact silt loam mottled with pale olive, gray, and strong brown; moderate, blocky structure.
36 inches +, light olive-gray, strong-brown, and light yellowish-brown, firm, compact silty clay that contains fragments of gravel and chert.

This soil has medium to slow runoff. Permeability is moderate in the surface layer and in the upper part of the subsoil, but it is slow in the lower part of the subsoil. The moisture-supplying capacity is moderately high. The root zone is moderately deep, and the hazard of erosion is moderately low.

Most of the acreage is used for row crops, hay, and pasture. Good yields of the commonly grown crops are obtained. (Capability unit IIe–6; woodland suitability group 13; wildlife productivity group 2.)

Christian Series

The Christian series consists of well-drained soils of the uplands. The soils have a yellowish-brown surface layer and a red, clayey subsoil. They developed in material weathered mainly from interbedded limestone, sandstone, and a small amount of shale. The soils are gently to strongly sloping.

The Christian soils occur with the Dickson, Baxter, Cookeville, Bewleyville, Caneyville, and Westmoreland soils. They lack the pan that is typical of the Dickson soils, their subsoil is more reddish and contains more clay, and the profile contains more sand. The Christian soils contain more sand and less chert than the Baxter soils. They are similar to the Cookeville soils, but their subsoil is less reddish and contains less chert. In addition, they contain more sand throughout, and they developed in material weathered from several kinds of rocks rather than from limestone alone. The Christian soils are less silty than the Bewleyville soils. Their surface layer is also lighter colored, their subsoil is more clayey and plastic, and their profile is more sandy throughout. They have thicker, better developed horizons than the Caneyville and Westmoreland soils, their subsoil is more reddish, and they contain more sand than the Westmoreland soils.

The Christian soils are used mainly to grow general farm crops, including tobacco, corn, small grains, hay, and pasture. Under good management, they are productive of these crops.

Christian silt loam, 2 to 6 percent slopes (ChB).—This well-drained soil has a surface layer that is medium textured and medium acid and a red, clayey subsoil that is strongly acid. The following describes a typical profile:

0 to 13 inches, yellowish-brown, friable silt loam changing to brown in lower part; granular structure.
13 to 18 inches, yellowish-red, friable silty clay loam that has weak, blocky structure.
18 to 39 inches, yellowish-red silty clay that has strong, blocky structure; firm when moist, hard when dry, sticky when wet.
39 to 50 inches, yellowish-red clay with few yellowish-brown and brownish-gray variegations; strong, blocky structure; fragments of sandstone are common.
50 inches +, yellowish-brown, red, and pale-yellow, firm clay that has pockets of sand and fragments of sandstone.

In places the subsoil is clay or sandy clay. This soil has medium to slow runoff, very high moisture-supplying capacity, a deep root zone, and moderate permeability. It is medium in content of organic matter and medium in natural fertility. It is also easy to work. The hazard of erosion is moderately low.

Mapped with this soil is approximately 425 acres of an eroded Christian silt loam, 51 acres of a Christian fine sandy loam, and 8 acres of an eroded Christian fine sandy loam. (Capability unit IIe–2; woodland suitability group 1; wildlife productivity group 1.)

Christian silt loam, 6 to 12 percent slopes (ChC).—This soil has medium runoff. The hazard of erosion is moderate.

Mapped with this soil is approximately 16 acres of a Baxter silt loam. The included areas are too small to be mapped separately. (Capability unit IIIe–2; woodland suitability group 1; wildlife productivity group 1.)

Christian silt loam, 6 to 12 percent slopes, eroded (ChC2).—In most places the surface layer of this soil consists of a mixture of material from the original surface layer and from the subsoil. In some places the present surface layer is red, clayey material that was originally part of the subsoil. The profile of this soil is similar to that of Christian silt loam, 2 to 6 percent slopes, but this soil has medium runoff and is low in content of organic matter. The hazard of further erosion is moderate.

Mapped with this soil is approximately 327 acres of an eroded Baxter silt loam. (Capability unit IIIe–2; woodland suitability group 1; wildlife productivity group 1.)

Christian silty clay loam, 6 to 12 percent slopes, severely eroded (CmC3).—In this soil most of the original surface layer has been removed by erosion, and the surface layer now consists primarily of red, clayey material from

the original subsoil. In places there are occasional, shallow gullies. The profile of this soil is similar to that of Christian silt loam, 2 to 6 percent slopes, but this soil has medium to rapid runoff and is very low in content of organic matter. The hazard of further erosion is moderately severe. The large amount of clay in the surface layer makes this soil somewhat difficult to till.

Mapped with this soil is approximately 17 acres of a severely eroded Christian fine sandy clay loam. (Capability unit IVe-11; woodland suitability group 6; wildlife productivity group 2.)

Christian silt loam, 12 to 20 percent slopes (ChD).—This soil has medium to rapid runoff. The hazard of erosion is severe.

Mapped with this soil is approximately 3 acres of a Baxter silt loam. (Capability unit IVe-3; woodland suitability group 2; wildlife productivity group 2.)

Christian silt loam, 12 to 20 percent slopes, eroded (ChD2).—In most places the surface layer of this soil consists of a mixture of soil material from the original surface layer and from the subsoil. In places the present surface layer is red, clayey material that was originally part of the subsoil. The soil has rapid runoff; the hazard of further erosion is severe. (Capability unit IVe-3; woodland suitability group 2; wildlife productivity group 2.)

Christian silty clay loam, 12 to 20 percent slopes, severely eroded (CmD3).—In this soil most of the original surface layer has been removed by erosion, and the present surface layer consists primarily of red, clayey soil material that was formerly part of the subsoil. The large amount of clay in the surface layer makes this soil somewhat difficult to till. In places there are occasional, shallow gullies.

The profile of this soil is similar to that of Christian silt loam, 2 to 6 percent slopes, but this soil has rapid runoff, moderately high moisture-supplying capacity, and a moderately deep root zone. It is very low in content of organic matter, and the hazard of further erosion is severe.

Mapped with this soil is approximately 50 acres of a severely eroded Christian fine sandy clay loam. (Capability unit VIe-2; woodland suitability group 6; wildlife productivity group 2.)

Christian fine sandy loam, 6 to 12 percent slopes, eroded (CfC2).—The profile of this soil is similar to that of Christian silt loam, 2 to 6 percent slopes, but it has a coarser textured surface layer. In most places the surface layer consists of a mixture of soil material from the original surface layer and from the subsoil. In places the present surface layer is red, clayey material that was originally part of the subsoil. This soil has medium runoff and moderately high moisture-supplying capacity. The hazard of further erosion is moderate.

On about 173 acres erosion has been no more than slight. In these places the plow layer has not had subsoil mixed with it. (Capability unit IIIe-3; woodland suitability group 1; wildlife productivity group 2.)

Christian fine sandy loam, 12 to 20 percent slopes, eroded (CfD2).—The profile of this soil is similar to that of Christian silt loam, 2 to 6 percent slopes, but it has a coarser textured surface layer. In most places the surface layer consists of a mixture of soil material from the original surface layer and from the subsoil. In some places the present surface layer consists of red, clayey material that was formerly part of the subsoil. In other places the subsoil is sandy clay loam.

This soil has medium to rapid runoff and moderately high moisture-supplying capacity. The hazard of further erosion is severe. The soil is low in content of organic matter and has moderately rapid permeability.

Mapped with this soil is a small acreage of an uneroded Christian fine sandy loam. The included areas are too small to be mapped separately. (Capability unit IVe-4; woodland suitability group 2; wildlife productivity group 2.)

Christian very rocky soils, 8 to 20 percent slopes, eroded (CrD2).—In most places the surface layer of these soils consists of a mixture of soil material from the original surface layer and from the red, clayey subsoil. The texture of the surface layer is variable and ranges from silt loam or loam to fine sandy loam. In many places the texture differs within short distances. In places the subsoil is clay, silty clay, or sandy clay. The strong slopes and the outcrops of limestone, which cover from 10 to 25 percent of the surface, make the use of heavy tillage equipment impractical.

This soil has rapid runoff and is low in content of organic matter. The hazard of further erosion is severe.

Mapped with this soil is about 196 acres of a Pembroke rocky silt loam and of an eroded Pembroke rocky silt loam. Also included is a small acreage of Colbert soils, which have a dark grayish-brown A_p horizon and a subsoil of light olive-brown clay. The Colbert soils are not mapped separately in this county. (Capability unit VIs-1; woodland suitability group 2; wildlife productivity group 2.)

Christian very rocky soils, 12 to 20 percent slopes, severely eroded (CrD3).—In most areas of these soils, more than 75 percent of the original surface layer has been lost through erosion. In these areas the present surface layer consists of red, clayey soil material that was formerly part of the subsoil. This clayey material hardens and cracks when dry. The texture of the surface layer ranges from silty clay loam to sandy clay loam. In many places it varies within short distances. In places the subsoil is clay, silty clay, or sandy clay. The strong slopes and outcrops of limestone, which cover from 10 to 25 percent of the surface, make the use of heavy tillage equipment impractical.

Runoff is rapid on these soils. The root zone is moderately deep. The soils are very low in moisture-supplying capacity and very low in content of organic matter. The hazard of further erosion is severe.

Mapped with these soils is a small acreage of a severely eroded Baxter very rocky soil and of a severely eroded Pembroke very rocky silty clay loam. (Capability unit VIIs-2; woodland suitability group 6; wildlife productivity group 3.)

Christian-Baxter cherty loams, 6 to 12 percent slopes, eroded (CsC2).—Approximately 65 percent of this complex is Christian cherty loam, and 35 percent is Baxter cherty loam. These soils occur in such an intricate pattern that it is impractical to map them separately. These are deep, well-drained, acid soils of the uplands. Their surface layer is cherty loam and their subsoil is red, clayey material. These soils developed in material weathered from cherty limestone, sandstone, and shale.

The Baxter soil in this complex has a more grayish surface layer than the regular Baxter soils. It also con-

tains more sand and some shale; the upper part of the subsoil contains more clay. The Christian soil in this complex differs from the regular Christian soil in having a cherty surface layer and some chert in the subsoil. The surface layer of the Christian soil is more brownish and lighter colored than that of the Baxter soil, and the upper part of the subsoil is coarser textured and less reddish. Also, the subsoil contains less chert. The following describes a typical profile of each soil:

Baxter cherty loam—

0 to 6 inches, dark grayish-brown cherty loam that has weak, granular structure in the upper part; grades to yellowish brown and has weak, blocky structure in lower part.

6 to 30 inches, yellowish-red cherty silty clay that has moderate, blocky structure and few brown variegations in upper part, and yellowish-red cherty clay that has few strong-brown variegations and strong, blocky structure in lower part; firm when moist, hard when dry, sticky when wet.

30 inches +, red cherty clay variegated with brownish yellow, reddish yellow, and light gray; strong, blocky structure; sand and fragments of sandstone and chert are common; the amount of sand and the number of fragments increases with increasing depth.

In places the surface layer is dark brown and the subsoil is silty clay. The amount of chert, sandstone, and shale in the lower part of the subsoil varies.

Some areas where the texture of the surface layer is silt loam are included. The included areas are too small to be mapped separately.

Christian cherty loam—

0 to 8 inches, brown cherty loam that has weak, fine, granular structure and grades to yellowish brown in lower part.

8 to 13 inches, strong-brown silty clay loam that contains few, fine, faint, brown variegations; weak, blocky structure.

13 to 28 inches, yellowish-red clay with few strong-brown variegations; very firm when moist, very hard when dry, and sticky when wet; strong, blocky structure; contains some sand, some fragments of fine sandstone, and a few fragments of chert.

28 inches +, red sandy clay splotched with yellow and red; contains sand and fragments of sandstone and a few angular fragments of chert; moderate, blocky structure; becomes more reddish and more clayey with increasing depth, and it also contains more sand and fragments of sandstone and chert; gray and brown variegations are common.

In places the surface layer is dark grayish brown and the subsoil is silty clay or sandy clay. The content of chert in the lower part of the subsoil is higher in places than in the profile described.

Mapped with this soil are some areas in which the surface layer is silt loam and a few areas where the subsoil is yellowish-brown, extremely firm clay. These included areas are too small to be mapped separately.

In most places part of the original surface layer of Christian-Baxter cherty loams, 6 to 12 percent slopes, eroded, has been lost through erosion, and cultivation has mixed some soil material from the subsoil with the present surface layer. In some places all of the present surface layer is red, clayey material that was originally part of the subsoil. In a small, wooded acreage most of the original surface layer has been retained.

These soils have medium runoff, a deep root zone, and moderately high moisture-supplying capacity. They are medium in natural fertility and low in content of organic matter. The hazard of further erosion is moderate. Permeability ranges from moderate in the surface layer and in the upper part of the subsoil to moderately slow in the lower part of the subsoil. Fragments of chert interfere, to some extent, with tillage.

Most of this complex is cultivated, but a few areas remain in trees, and some areas are idle. Fair to good yields of corn, tobacco, hay, and pasture are obtained. (Capability unit IIIe-6; woodland suitability group 1; wildlife productivity group 2.)

Christian-Baxter cherty loams, 12 to 20 percent slopes, eroded (CsD2).—The profile of these soils is similar to that of Christian-Baxter cherty loams, 6 to 12 percent slopes, eroded, but these soils have rapid runoff and a moderately deep root zone. The hazard of further erosion is moderately severe. (Capability unit IVe-3; woodland suitability group 2; wildlife productivity group 2.)

Christian-Baxter cherty loams, 20 to 30 percent slopes, eroded (CsE2).—These soils have rapid runoff and a moderately deep root zone. The hazard of further erosion is severe. (Capability unit VIe-1; woodland suitability group 2; wildlife productivity group 2.)

Christian-Baxter cherty loams, 20 to 30 percent slopes, severely eroded (CsE3).—In most places the original surface layer of these soils has been lost through erosion and the present surface layer consists of red, clayey soil material that was formerly part of the subsoil. In places there are occasional, shallow gullies. The cherty, clayey surface layer makes tillage somewhat difficult.

These soils have rapid or very rapid runoff, a moderately deep root zone, and low moisture-supplying capacity. They contain little organic matter. The hazard of further erosion is severe. A few areas have a slope of as much as 40 percent. (Capability unit VIIe-1; woodland suitability group 6; wildlife productivity group 3.)

Colyer Series

The Colyer series consists of somewhat excessively drained, strongly acid soils of the uplands. The soils have a thin, weakly developed surface layer of shaly silt loam and a subsoil of shaly silty clay loam that overlies black, acid shale at a depth of approximately 18 inches. The soils developed in material weathered from black, fissile shale. They are strongly sloping to moderately steep.

These soils occur near the Rockcastle, Westmoreland, and Landisburg soils. They are more grayish, coarser textured, and more shaly than the Rockcastle soils, and they developed in a different kind of parent material. The Colyer soils are more strongly acid than the Westmoreland soils, and they have a less yellowish subsoil and developed in a different kind of parent material. They are steeper and shallower over bedrock than the Landisburg soils, and they have a more weakly developed profile and more rapid internal drainage. In addition, they are on the uplands rather than along stream terraces.

The Colyer soils are mainly in forest. Most of the acreage that has been cleared is idle. Low yields of corn, small grains, hay, and pasture are obtained in cultivated areas.

Colyer shaly silt loam, 12 to 30 percent slopes (CtE).—This is the only Colyer soil mapped in the county. It is a somewhat excessively drained, strongly acid soil of the uplands and is shallow over bedrock. The following describes a typical profile:

0 to 11 inches, dark grayish-brown, friable shaly silt loam.
11 to 18 inches, brown, yellowish-red, and brownish-gray silty clay loam that has weak, blocky structure; contains numerous partly weathered fragments of shale.
18 inches +, unweathered, black, highly fissile, acid shale.

Runoff is very rapid on this soil. The moisture-supplying capacity is very low, and the soil has a shallow root zone. It is medium in content of organic matter, low in natural fertility, and has moderate permeability. In places a moderate amount of erosion has taken place, and, as a result, the surface layer is thinner and more shaly than that in the typical soil. In a few small areas, the black shale bedrock is exposed. (Capability unit VIIs–1; woodland suitability group 9; wildlife productivity group 3.)

Cookeville Series

The Cookeville series consists of deep, well-drained, medium acid soils of the uplands. The surface layer of these soils is yellowish-brown silt loam, and their subsoil is red, clayey material. The soils developed in material weathered from cherty limestone.

These soils occur in sloping areas with the Baxter, Dickson, Bewleyville, and Mountview soils. They are somewhat similar to the Baxter soils but are essentially free of sizable chert fragments to a depth of 4 to 5 feet. They are better drained than the Dickson soils, their subsoil is more reddish and contains more clay, and they lack the fragipan that is typical of the Dickson soils. Their subsoil is more reddish than that of the Bewleyville and Mountview soils, and it contains more clay. Also, the Cookeville soils developed in material weathered from cherty limestone, rather than partly from silty material.

These soils occur mainly in the central part of the county. Most of the acreage is used for row crops, hay, and pasture, and good yields are obtained.

Cookeville silt loam, 6 to 12 percent slopes, eroded (CvC2).—This is the only Cookeville soil mapped in the county. It is deep and well drained, and it is medium acid. The following describes a typical profile:

0 to 6 inches, yellowish-brown, friable silt loam.
6 to 15 inches, yellowish-red, firm silty clay loam that has moderate, blocky structure.
15 to 60 inches, dark-red clay with pockets of yellowish red and splotches of yellowish brown; strong, blocky structure; firm when moist, hard when dry, sticky when wet; contains a few fragments of chert.
60 to 90 inches +, red, firm clay splotched and streaked with brown, pale yellow, and grayish brown; strong, blocky structure; fragments of chert are common.

In most places erosion has removed part of the original surface layer and cultivation has mixed some subsoil material with that in the original surface layer. In some places all of the present surface layer is red, clayey soil material that was originally part of the subsoil. In a few areas in the northwestern part of the county, this soil contains some sand and has fragments of chert and quartz pebbles in the profile.

Runoff is medium on this soil. Permeability is moderate and the root zone is deep. The soil is low in content of organic matter and high in natural fertility. It is high in moisture-supplying capacity and is easy to work. The hazard of further erosion is moderate.

Mapped with this soil is approximately 217 acres of an uneroded Cookeville silt loam and 13 acres of a severely eroded Cookeville silty clay loam. In the uneroded areas the soil material is deeper over the red, clayey subsoil than in the eroded areas. The surface layer in the severely eroded areas is finer textured than that in the uneroded areas, and the present surface layer in most places consists of red, clayey material that was originally part of the subsoil. (Capability unit IIIe–2; woodland suitability group 1; wildlife productivity group 1.)

Dickson Series

The Dickson series consists of moderately well drained or well drained, strongly acid soils that have a fragipan and are on the uplands. The soils have a surface layer of brown silt loam and a subsoil of yellowish-brown silty clay loam over a mottled, brittle, compact pan. They developed in a mantle of loess over material weathered from cherty limestone.

These soils are on gently sloping ridges near the Baxter, Cookeville, Bewleyville, and Christian soils. They are distinguished from these soils by a fragipan, a lighter colored surface layer, and a subsoil that is brownish rather than red. The Dickson soils resemble the Sango soils, but their surface layer is less grayish; their subsoil is more brownish, less yellowish, and less friable; and they are somewhat better drained and more productive.

The Dickson soils are widely distributed throughout the county. Most of the acreage is used for general farm crops, including corn, burley tobacco, small grains, hay, and pasture.

Dickson silt loam, 2 to 6 percent slopes (DcB).—This is the only Dickson soil mapped in the county. It is a moderately well drained or well drained, strongly acid soil of the uplands. It contains a compact layer, or pan. The following describes a typical profile:

0 to 11 inches, brown, friable silt loam ranging to yellowish brown in lower part; weak, blocky structure.
11 to 26 inches, yellowish-brown, friable silty clay loam with few light brownish-gray variegations; moderate, blocky structure.
26 to 34 inches, yellowish-brown, firm, brittle pan of compact silty clay loam with many variegations of light brownish gray and strong brown; moderate, blocky structure.
34 inches +, yellowish-red, pale-yellow, and light-gray, firm silty clay that contains fragments of chert.

This soil varies primarily in the depth to and compactness of the third layer, which is the fragipan. Depth to the pan ranges from 20 to 30 inches or more.

Runoff is medium to slow on this soil, and the moisture-supplying capacity is high. The soil has a medium content of organic matter, moderate permeability, moderately high natural fertility, and a moderately deep root zone. The hazard of erosion is moderately low. Tillage implements can be used with ease.

Mapped with this soil is approximately 25 acres of Dickson silt loam, nearly level phase; 175 acres of an eroded Dickson silt loam; and a small acreage of a Russellville silt loam, which is not mapped separately in this county. The surface layer of the Russellville soil is dark-brown, friable silt loam, and the upper part of its subsoil is strong-brown, firm to friable silty clay loam. A thin, firm, brittle, compact fragipan is at a depth of 28 to 36 inches. The nearly level inclusion of Dickson

silt loam is slightly less well drained than this gently sloping phase. The eroded inclusions have a thinner surface layer that consists of a mixture of material from the original surface layer and subsoil. (Capability unit IIe-10; woodland suitability group 10; wildlife productivity group 1.)

Dunning Series

The Dunning series consists of poorly drained, dark-colored, neutral soils of the flood plains. The soils consist of alluvium that was washed from soils of limestone origin. The uppermost 18 inches is very dark grayish-brown to black silt loam or silty clay loam; beneath that layer is mottled grayish-brown or gray silty clay.

These soils are more poorly drained, darker colored, and finer textured than the Huntington, Lindside, and Newark soils that also formed in alluvium from limestone. They are finer textured, darker colored, and less acid than the poorly drained Melvin soils.

The Dunning soils are of minor extent and are along the large creeks. Most of them have been cleared and are idle or in pasture. On a few areas that have been tile drained, good yields of corn are obtained.

Dunning silt loam (Du).—This is the only Dunning soil mapped in the county. It is a poorly drained, neutral, dark-colored soil of the flood plains. The following describes a typical profile:

0 to 18 inches, very dark grayish-brown silt loam in the upper half and black silty clay loam in the lower half.
18 to 48 inches +, grayish-brown, plastic silty clay to a depth of about 36 inches; then yellowish-brown, more plastic silty clay.

In places the surface layer of this soil is black silty clay loam.

This soil is subject to occasional overflow; it has slow or very slow runoff, moderately slow permeability, a moderately deep root zone, and high moisture-supplying capacity. This soil is high in content of organic matter and in natural fertility. If it is drained, it has potential for high yields. (Capability unit IIIw-7; woodland suitability group 15; wildlife productivity group 3.)

Etowah Series

The Etowah series consists of deep, well-drained soils that developed in old alluvium. The alluvium washed chiefly from soils formed in material weathered mainly from limestone but partly from sandstone and shale. These soils have a thick surface layer of dark-brown, medium acid, friable silt loam. They have a reddish-brown to dark-red, strongly acid, clayey subsoil. The soils are gently sloping or sloping.

These soils occur on terraces near the Captina, Taft, and Humphreys soils. They have a darker colored surface layer and a more reddish subsoil than the Captina and Taft soils, and they are well drained and do not have a pan. They have a darker brown surface layer and a more reddish subsoil than the Humphreys soils and lack the content of chert that is typical of those soils.

The Etowah soils occur mainly in small areas in the southern part of the county. Nearly all of the acreage has been cleared. Good yields of corn, small grains, hay, burley tobacco, and pasture are obtained.

Etowah silt loam, 2 to 6 percent slopes (EtB).—This is a well-drained soil of stream terraces. It has a thick surface layer of dark-brown, medium acid, friable silt loam and a reddish-brown to dark-red, strongly acid, clayey subsoil. The following describes a typical profile:

0 to 15 inches, dark-brown, friable silt loam that has granular structure in the upper part and weak, blocky structure in the lower part.
15 to 29 inches, yellowish-red, friable silty clay loam that has moderate, blocky structure in upper part; reddish-brown, firm silty clay loam in the lower part.
29 to 64 inches, yellowish-red, firm silty clay that has moderate, blocky structure in upper part; color dark red and structure more pronounced in lower part.
64 inches +, red, dark-red, and strong-brown, firm silty clay.

In places the upper part of the subsoil is silty clay, and in some places the colors are somewhat lighter than those described in the profile.

This soil has medium to slow runoff, a deep root zone, moderately rapid permeability, and high moisture-supplying capacity. It is medium in content of organic matter and high in natural fertility. The hazard of erosion is moderately low, and the soil is easy to work.

Most of the acreage is used for cultivated crops. Good yields of corn, small grains, hay, burley tobacco, and pasture are obtained.

Mapped with this soil is a small acreage of Elk soils, which have a strong-brown subsoil and slightly weaker profile development than the Etowah soils. The Elk soils are not mapped separately in this county. (Capability unit IIe-1; woodland suitability group 1; wildlife productivity group 1.)

Etowah silt loam, 6 to 12 percent slopes (EtC).—In places erosion has removed part of the original surface layer of this soil, and in these areas the present surface layer consists of a mixture of soil material from the original surface layer and the subsoil. Etowah silt loam, 6 to 12 percent slopes, has medium runoff. The hazard of erosion is moderate.

Mapped with this soil is a small acreage of Cumberland and Elk soils. The Cumberland soil has a surface layer of dark reddish brown and a subsoil that is more reddish and more clayey than that of the Etowah soils. The Elk soils have a more brownish subsoil and weaker profile development than the Etowah soils. The Cumberland and Elk soils are not mapped separately in this county. (Capability unit IIIe-1; woodland suitability group 1; wildlife productivity group 1.)

Frankstown Series

The Frankstown series consists of well-drained, cherty soils of medium texture. The soils have a surface layer of grayish-brown cherty silt loam and a subsoil of yellowish-brown cherty silty clay loam. Depth to bedrock, which consists chiefly of loose chert with some cherty limestone, ranges from 28 to 36 inches. These soils developed in material weathered from cherty limestone. The soils have a medium or strongly acid surface layer and a strongly acid subsoil. They are moderate in natural fertility.

The Frankstown soils are mainly on the gently sloping or strongly sloping ridgetops in the northeastern part of the county. They are near the Bodine, Mountview, and Sango soils. The Frankstown soils are deeper over bed-

rock, have a more strongly developed profile, and are commonly less cherty throughout the solum than are the Bodine soils. They are more cherty than the Mountview soils and lack the loess component. They are steeper, more cherty, and better drained than the Sango soils, and they do not have the pan that is typical of those soils. In some places they occur with the Baxter soils, but they contain less clay than those soils and do not have a reddish subsoil.

More than one-half of the acreage has been cleared and is used mostly for hay and pasture. Low to fair yields of corn, tobacco, and other crops are obtained in the cultivated areas.

Frankstown cherty silt loam, 6 to 12 percent slopes (FtC).—This is a well-drained, cherty, acid soil. The following describes a typical profile:

- 0 to 12 inches, grayish-brown cherty silt loam in the upper part, but the color ranges to yellowish brown in the lower half.
- 12 to 32 inches, yellowish-brown cherty silty clay loam that has blocky structure.
- 32 inches +, chert bed that contains crevices filled with silty clay.

This soil is low in content of organic matter, moderate in natural fertility, and moderately high in moisture-supplying capacity. It has a moderately deep or deep root zone, moderately rapid permeability, and medium runoff. The hazard of erosion is moderate. The soil is slightly difficult to work because of the large amount of chert fragments.

Low to fair yields of corn and tobacco are obtained on this soil. Most of the cleared areas are used for hay and pasture. Almost half of the acreage is in forest. (Capability unit IIIe-6; woodland suitability group 1; wildlife productivity group 2.)

Frankstown cherty silt loam, 2 to 6 percent slopes (FtB).—This soil has medium to slow runoff. The hazard of erosion is moderately low. (Capability unit IIe-11; woodland suitability group 1; wildlife productivity group 2.)

Frankstown cherty silt loam, 6 to 12 percent slopes, eroded (FtC2).—The profile of this soil is similar to that of Frankstown cherty silt loam, 6 to 12 percent slopes, but the surface layer is less grayish and is slightly more cherty. This soil is very low in content of organic matter.

Mapped with this soil is a small acreage of a soil that has little or none of the original surface layer remaining. (Capability unit IIIe-6; woodland suitability group 1; wildlife productivity group 2.)

Frankstown cherty silt loam, 12 to 20 percent slopes (FtD).—This soil has medium to rapid runoff. The hazard of erosion is moderately severe. (Capability unit IVe-4; woodland suitability group 2; wildlife productivity group 2.)

Frankstown cherty silt loam, 12 to 20 percent slopes, eroded (FtD2).—The profile of this soil is similar to that of Frankstown cherty silt loam, 6 to 12 percent slopes, but its surface layer is less grayish and contains more chert. The soil is moderately low in moisture-supplying capacity, and it has a moderately deep root zone. The hazard of further erosion is moderately severe. (Capability unit IVe-4; woodland suitability group 2; wildlife productivity group 2.)

Gullied Land

This miscellaneous land type consists of land that has been so cut by deep gullies or has undergone such severe sheet erosion that the soil profile has been largely destroyed. Of the original soils, only the narrow strips between the gullies remain. In places where sheet erosion has been prevalent, the parent material and bedrock are exposed and the gullies are less noticeable.

Gullied land (Gn).—In approximately 80 percent of this miscellaneous land type, the soil material that remains is of limestone and sandstone origin. In a small part of the acreage where the original soil profile was shallow over shale, the gullies are shallow to bedrock. These areas are not suited to crops or pasture, and they are mainly idle. A few small areas have been reclaimed for pasture by leveling them. Suitable pasture plants have been difficult to establish on these areas. (Capability unit VIIe-4; woodland suitability group 6; wildlife productivity group 3.)

Guthrie Series

The Guthrie series consists of poorly drained, strongly acid soils that have a fragipan. The soils have a light brownish-gray, mottled surface layer and a light-gray, highly mottled subsoil. They developed, in part, in silty material that forms a mantle over material weathered from cherty limestone. The Guthrie soils occupy nearly level to slightly depressed positions in the uplands.

These soils occur with the Dickson, Sango, Lawrence, and Mountview soils. They are more poorly drained than any of those soils, and their profile is more grayish and more mottled. They are more nearly level than the Mountview soils.

The Guthrie soils are of limited extent and occur primarily in the east-central part of the county. Most of the acreage remains in hardwood forests, but a small acreage is in pasture. In cultivated areas crop yields are low.

Guthrie silt loam (Gu).—This is the only Guthrie soil mapped in the county. It is a poorly drained, strongly acid soil of the uplands. The soil is grayish and medium textured, and it has a fragipan. The following describes a typical profile:

- 0 to 6 inches, light brownish-gray, friable silt loam with few strong-brown mottles.
- 6 to 17 inches, light grayish-brown silty clay loam mottled with strong brown and olive gray; weak, blocky structure.
- 17 to 45 inches +, mottled, strong-brown, grayish-brown, and gray, very firm, compact silty claypan that has blocky structure; the lower part is massive and contains a large amount of chert fragments.

The depth to the fragipan ranges from approximately 10 to 20 inches. In some places the texture of the fragipan is silty clay loam, and in other places it is silt loam.

This soil has very slow runoff, moderately low moisture-supplying capacity, and a shallow root zone. It is moderately low in natural fertility and low in content of organic matter. There is no hazard of erosion. Permeability is moderate above the compact layer, or pan, but it is slow in the pan. This soil is easy to work.

During the winter months or during periods of high rainfall, this soil tends to be very wet, and in places

water stands on the surface. The soil is slow to dry out and warm up in the early part of the growing season, but it becomes very dry during short periods of dry weather in summer.

Most of the acreage is in hardwood forests, but a small acreage is used to grow pasture plants that tolerate water. In areas that are cultivated, crop yields are low. (Capability unit IVw–1; woodland suitability group 15; wildlife productivity group 3.)

Humphreys Series

The Humphreys series consists of well-drained, medium or strongly acid soils of the stream terraces, alluvial fans, and foot slopes. The soils have a surface layer of brown cherty silt loam and a subsoil of yellowish-brown cherty silty clay loam. The slopes are gentle to moderately steep. These soils are near the Landisburg, Taft, Huntington, and Staser soils. They are better drained than the Landisburg and Taft soils, and they lack the fragipan that is typical of those soils. They occupy positions above the Huntington and Staser soils; their profile is more strongly developed and they are more acid than those soils.

The Humphreys soils are widely distributed, and they are important to agriculture. Approximately three-fourths of the acreage has been cleared and is used for crops, but some of the acreage is idle. Fair to moderate yields of corn, small grains, hay, tobacco, and pasture are obtained. The trees that are most common in forested areas are oak, yellow-poplar, and hickory.

Humphreys cherty silt loam, 2 to 6 percent slopes (HcB).—This is a deep, well-drained, medium or strongly acid soil. Its surface layer is brown cherty silt loam, and its subsoil is yellowish-brown cherty silty clay loam. This soil is on terraces, foot slopes, and fans. The following describes a typical profile:

0 to 7 inches, brown, friable cherty silt loam.
7 to 28 inches, yellowish-brown, firm cherty silty clay loam that has weak, blocky structure.
28 inches +, stratified layers of chert, gravel, sand, and clay.

In some places the surface layer is dark grayish brown and the subsoil is strong brown. In places on the steeper slopes, the subsoil is underlain by variegated reddish-brown, yellowish-red, and light yellowish-brown, firm silty clay. In some places the lower part of the subsoil is underlain by acid, gray clay shale at a depth of about 25 inches.

This soil has medium to slow runoff, high moisture-supplying capacity, and moderate permeability. It is medium in content of organic matter and moderate in natural fertility. The root zone is deep. The hazard of erosion is moderately low. This soil is slightly difficult to work because of the large amount of chert.

Most of the acreage has been cleared and is used for crops. Fair to moderate yields of corn, small grains, hay, tobacco, and pasture are obtained.

Mapped with this soil is 24 acres of Humphreys cherty silt loam, 0 to 2 percent slopes, and of an eroded Humphreys cherty silt loam. The eroded soil has lost part of the original surface layer through erosion, and some material from the subsoil has been mixed with the surface soil. Also included is a small acreage of a Greendale cherty silt loam and a Renox shaly silt loam. The Greendale and Renox soils are not mapped separately in this county. The profile of the Greendale soil is less well developed than that of the Humphreys soils, and the Renox soil has lighter colored and more shaly underlying layers. (Capability unit IIe–11; woodland suitability group 12; wildlife productivity group 2.)

Humphreys cherty silt loam, 6 to 12 percent slopes (HcC).—This soil has medium runoff and moderately high moisture-supplying capacity. The hazard of erosion is moderate. (Capability unit IIIe–6; woodland suitability group 12; wildlife productivity group 2.)

Humphreys cherty silt loam, 6 to 12 percent slopes, eroded (HcC2).—Part of the original surface layer of this soil has been lost through erosion. The present surface layer consists of a mixture of material from the original surface layer and from the subsoil. In some small, exposed areas, the present surface layer is yellowish-brown silty clay loam that was originally part of the subsoil.

This soil has a moderately deep root zone. Runoff is medium. The soil is low in content of organic matter. The hazard of further erosion is moderate.

Mapped with this soil is approximately 137 acres of an uneroded Humphreys cherty silt loam. In these areas the soil still has most of the original surface layer. (Capability unit IIIe–6; woodland suitability group 12; wildlife productivity group 2.)

Humphreys cherty silt loam, 12 to 20 percent slopes, eroded (HcD2).—In most places erosion has removed part of the original surface layer of this soil and the present surface layer consists of a mixture of material from the original surface layer and the subsoil. In some places all of the original surface layer has been lost and the present surface layer is soil material that was originally part of the subsoil. The profile is similar to that of Humphreys cherty silt loam, 2 to 6 percent slopes, but this soil has rapid runoff. It also has a moderately deep root zone, moderately high moisture-supplying capacity, and moderately rapid permeability. It is low in content of organic matter.

Mapped with this soil is approximately 259 acres of Humphreys cherty silt loam, 12 to 20 percent slopes, uneroded. (Capability unit IVe–4; woodland suitability group 12; wildlife productivity group 2.)

Humphreys cherty silt loam, shallow, 12 to 20 percent slopes, eroded (HeD2).—In this soil the surface layer consists of material from both the original surface layer and the subsoil. In addition the underlying shale bedrock is at a depth of only 16 to 20 inches. This soil has rapid runoff and moderately low moisture-supplying capacity. It is low in content of organic matter. The hazard of further erosion is severe. (Capability unit VIe–1; woodland suitability group 9; wildlife productivity group 2.)

Humphreys cherty silt loam, 20 to 30 percent slopes (HcE).—Runoff is rapid on this steep soil, and there is a severe hazard of erosion. The root zone is moderately deep, and the moisture-supplying capacity is moderately high. This soil has moderately rapid permeability. It is low in content of organic matter. Most of the acreage is in trees. (Capability unit VIe–1; woodland suitability group 12; wildlife productivity group 2.)

Humphreys cherty silt loam, 20 to 30 percent slopes, eroded (HcE2).—In most places part of the original surface layer of this soil has been lost through erosion and the present surface layer is composed of a mixture of material

from the orginal surface layer and the subsoil. In some places all of the present surface layer consists of soil material that was originally part of the subsoil. This soil has rapid runoff, and the hazard of further erosion is severe. It also has a moderately deep root zone and is low in content of organic matter. (Capability unit VIe-1; woodland suitability group 12; wildlife productivity group 2.)

Humphreys silt loam, 6 to 12 percent slopes (HdC).—The profile of this soil is similar to that of Humphreys cherty silt loam, 2 to 6 percent slopes, but this soil has a more brownish surface layer, is essentially free of chert, and is easier to till. Runoff is medium.

Mapped with this soil is a small acreage in which the slopes are as much as 20 percent. (Capability unit IIIe-2; woodland suitability group 12; wildlife productivity group 1.)

Huntington Series

The Huntington series consists of deep, well-drained, neutral or slightly acid soils of the flood plains. The soils have a surface layer of brown, friable silt loam and a subsoil of dark yellowish-brown, friable silt loam. They developed in recent alluvium washed mainly from soils of limestone origin but partly from soils of sandstone and shale origin.

The Huntington soils occur near the Staser, Lindside, Newark, Melvin, Wolftever, Whitwell, and Sequatchie soils. They contain more material from limestone than the Staser soils, and their profile is more brownish throughout. They are better drained than the Lindside, Newark, and Melvin soils. The Huntington soils are better drained than the Wolftever and Whitwell soils, but they show less profile development, are less acid and have a coarser textured subsoil. In drainage, the Huntington soils are similar to the Sequatchie soils, but they are in lower lying positions and have less profile development. They are also less acid and contain a larger amount of limestone material. In some places the Huntington soils are near the Dunning soils, but they are better drained, coarser textured, and lighter colored than those soils.

The Huntington soils are widely distributed and are agriculturally important. Nearly all of the acreage is in cultivated crops. Excellent yields of all the crops commonly grown in the county are obtained.

Huntington silt loam (Hu).—This deep, well-drained, medium-textured soil is neutral or slightly acid. It is on flood plains. The following describes a typical profile:

0 to 10 inches, dark-brown, friable silt loam.
10 to 30 inches, dark yellowish-brown silt loam that has granular structure.
30 inches +, dark yellowish-brown, friable silt loam that contains stratified layers of sandy loam at a depth below 40 inches.

In places the stratified material is at a depth somewhat greater than 40 inches and its texture varies.

Runoff is slow on this nearly level soil. Permeability is moderately rapid. The soil has a deep root zone and very high moisture-supplying capacity. It is high in natural fertility, medium in content of organic matter, and easy to work. There is no hazard of erosion, but because this soil is in low areas near streams, it is subject to occasional overflow.

Almost all of the acreage is used for corn, tobacco, alfalfa, soybeans, and other crops commonly grown in the county. Excellent yields are obtained of all these crops.

Mapped with this soil is approximately 412 acres of Huntington silt loam, local alluvium phase, which is near the heads of streams and in depressions in the uplands. The included soil developed in material of local origin rather than in material carried from a distance. (Capability unit I-1; woodland suitability group 11; wildlife productivity group 1.)

Huntington fine sandy loam (Hf).—The profile of this soil is similar to that of Huntington silt loam, but it contains more sand. This soil has a dark-brown, very friable, slightly acid surface layer and a subsoil of dark yellowish-brown, very friable, medium acid fine sandy loam to loam. It has rapid permeability and high moisture-supplying capacity. This soil is slightly less productive of the crops commonly grown than Huntington silt loam. (Capability unit I-1; woodland suitability group 11; wildlife productivity group 1.)

Huntington gravelly loam (Hg).—The profile of this soil is similar to that of Huntington silt loam, but it is lighter colored, contains a large amount of sand and gravel throughout, and is generally shallower over stratified, gravelly alluvium. In places there is some mottling at a depth of 2 to 2½ feet. This soil is also slightly more acid, has a moderately high moisture-supplying capacity, and has rapid permeability. It is medium in natural fertility. This soil is more difficult to work and is less productive than Huntington silt loam. It is also suited to a smaller number of crops. (Capability unit IIs-1; woodland suitability group 11; wildlife productivity group 2.)

Landisburg Series

The Landisburg series consists of moderately well drained, strongly acid, medium-textured soils that have a compact fragipan. The fragipan, which in places is cherty, is at a depth of 20 to 30 inches. The soils have a surface layer of grayish-brown to brown silt loam and a subsoil of yellowish-brown silty clay loam or silt loam. They developed mainly in alluvium washed from soils of limestone origin, but, to a lesser extent, in alluvium washed from soils of sandstone and shale origin. The soils are nearly level to strongly sloping and are on stream terraces and foot slopes.

The Landisburg soils are on foot slopes below the Bodine and Westmoreland soils. They are also near the Humphreys soils on stream terraces and foot slopes and near the Taft soils on stream terraces. The Landisburg soils are deeper over bedrock and are more poorly drained than the Bodine and Westmoreland soils, and they have a fragipan and a more highly developed profile than those soils. They are more acid than the Westmoreland soils. The Landisburg soils are lighter colored, have a coarser textured subsoil, contain more mottles, and are more poorly drained than the Humphreys soils. They are better drained and less mottled than the Taft soils.

The Landisburg soils are widely distributed throughout the county, and they are moderately important to agriculture. Nearly all of the acreage has been cleared and is used for corn, tobacco, hay, and pasture. Yields are low to fair.

Landisburg cherty silt loam, 6 to 12 percent slopes (LaC).—This moderately well drained, strongly acid soil has a fragipan at a depth of 20 to 30 inches. The following describes a typical profile:

0 to 13 inches, brown, friable cherty silt loam in upper part; yellowish-brown heavy cherty silt loam that has weak, blocky structure in lower part.
13 to 24 inches, yellowish-brown, firm cherty silty clay loam that has weak, blocky structure; few light brownish-gray mottles.
24 to 36 inches, mottled, yellowish-brown, light olive-brown, and yellowish-red cherty silt loam; firm, brittle, or compact pan.
36 inches +, yellowish-red and light brownish-gray, firm cherty silty clay loam.

The pan varies in thickness and in degree of compactness. In places it is primarily a partly cemented chert pan. The subsoil ranges from silty clay loam to silt loam in texture, and in places the upper part is more mottled than that described in the typical profile. Chert is nearly absent in some places.

This soil has medium runoff and moderately low moisture-supplying capacity. Its root zone is moderately deep. The soil is medium in content of organic matter and moderate in natural fertility. Permeability is moderate above the pan and slow in the pan. The hazard of erosion is moderate. The chert interferes to some extent with the use of tillage equipment.

Most of the acreage has been cleared and is used for row crops and pasture. Low to fair yields of corn, tobacco, hay, and pasture are obtained. (Capability unit IVe–16; woodland suitability group 13; wildlife productivity group 3.)

Landisburg cherty silt loam, 0 to 2 percent slopes (LaA).—The profile of this soil is similar to that of Landisburg cherty silt loam, 6 to 12 percent slopes, but this soil is nearly level, has more mottles above the pan, and has slow runoff. This soil is also inclined to be wet. There is no hazard of erosion. (Capability unit IIw–2; woodland suitability group 13; wildlife productivity group 2.)

Landisburg cherty silt loam, 2 to 6 percent slopes (LaB).—This soil has medium to slow runoff. The hazard of erosion is moderately low. (Capability unit IIIe–15; woodland suitability group 13; wildlife productivity group 2.)

Landisburg cherty silt loam, 6 to 12 percent slopes, eroded (LaC2).—In this soil the surface layer, in most places, consists of a mixture of soil material from the original surface layer and the subsoil. This soil has a shallow root zone. It is low in moisture-supplying capacity and in content of organic matter. The hazard of further erosion is moderately severe. (Capability unit IVe–16; woodland suitability group 13; wildlife productivity group 3.)

Landisburg cherty silt loam, 12 to 20 percent slopes, eroded (LaD2).—In most places the present surface layer of this soil consists of a mixture of soil material from the original surface layer and the subsoil. This soil has rapid runoff and very low moisture-supplying capacity. The root zone is shallow, and the content of organic matter is very low. The hazard of further erosion is severe.

Low yields of cultivated crops are obtained on this soil. A large acreage is in pasture, and some of the acreage is idle.

On about 116 acres the slope is less than 12 percent and erosion has been no more than slight. In these areas the plow layer consists of original surface soil. Also mapped with this soil is 26 acres of a Leadvale silt loam, which is not mapped separately in this county. The Leadvale soil is free of chert and contains a large amount of shaly material. It has a pale-olive surface layer and a light yellowish-brown subsoil mottled with olive gray. (Capability unit VIe–8; woodland suitability group 13; wildlife productivity group 3.)

Landisburg silt loam, 0 to 2 percent slopes (LdA).—The profile of this soil is similar to that of Landisburg cherty silt loam, 6 to 12 percent slopes, but this soil is nearly level, more mottled above the pan, and free of chert. It also has moderately high moisture-supplying capacity, is easier to till, and is slightly more wet. There is no hazard of erosion.

Mapped with this soil is a small acreage of a Captina silt loam that has slopes of 0 to 2 percent. (Capability unit IIw–2; woodland suitability group 13; wildlife productivity group 2.)

Landisburg silt loam, 2 to 6 percent slopes (LdB).—The profile of this soil is similar to that of Landisburg cherty silt loam, 6 to 12 percent slopes, but this soil is free of chert and has medium to slow runoff. It is also moderately high in moisture-supplying capacity and is more easily tilled. The hazard of erosion is moderately low.

Mapped with this soil is approximately 14 acres of a Leadvale silt loam and 57 acres of a Cavode silt loam. Neither of these soils is mapped separately in this county. The Leadvale soil is similar to the Leadvale soil mapped with Landisburg cherty silt loam, 12 to 20 percent slopes, eroded. The Cavode soil is free of chert. It developed in material from soils that originated primarily from acid, gray clay shale. The Cavode soil has a grayish-brown to pale-yellow surface layer and a pale-olive subsoil mottled with light yellowish brown. (Capability unit IIe–7; woodland suitability group 13; wildlife productivity group 2.)

Landisburg silt loam, 6 to 12 percent slopes (LdC).—The profile of this soil is similar to that of Landisburg cherty silt loam, 6 to 12 percent slopes, but this soil is free of chert, moderately high in moisture-supplying capacity, and easier to till.

Mapped with this soil is approximately 37 acres of a Leadvale silt loam and 50 acres of a Cavode silt loam. Neither of these included soils is mapped separately in this county, but they are similar to the Leadvale and Cavode soils mapped with Landisburg silt loam, 2 to 6 percent slopes. (Capability unit IIIe–9; woodland suitability group 13; wildlife productivity group 2.)

Landisburg silt loam, 6 to 12 percent slopes, eroded (LdC2).—In most places the surface layer of this soil consists of a mixture of material from the original surface layer and the subsoil. This soil contains no chert. It is low in moisture-supplying capacity and in content of organic matter. The soil has a shallow root zone. The hazard of further erosion is moderately severe.

Mapped with this soil is approximately 15 acres of an eroded Leadvale silt loam and 7 acres of an eroded Cavode silt loam. These soils are not mapped separately in this county, but they are similar to the Leadvale and Cavode soils mapped with Landisburg silt loam, 2 to 6 percent

slopes. (Capability unit IIIe-9; woodland suitability group 13; wildlife productivity group 3.)

Lawrence Series

The Lawrence series consists of somewhat poorly drained, strongly acid soils that have a fragipan. These nearly level soils are on uplands. They have a surface layer of grayish-brown to light yellowish-brown silt loam, and the upper part of their subsoil is yellow, mottled silt loam. A layer of firm, compact silty clay loam, mottled with light brownish gray, light olive brown, and pale brown, is at a depth ranging from 12 to 25 inches. The Lawrence soils developed in part from loess or from material that resembles loess and in part from cherty material weathered from limestone.

The Lawrence soils occur with the Guthrie, Dickson, Sango, and Mountview soils. Their profile is less grayish throughout than that of the Guthrie soils, the upper part of their subsoil is also less mottled, and they are better drained. The Lawrence soils are more poorly drained than the Dickson and Sango soils, their profile is lighter colored throughout, and their subsoil contains more mottles. The Lawrence soils are more poorly drained and more nearly level than the Mountview soils. They are also lighter colored throughout the profile and are mottled and have a fragipan.

The Lawrence soils are moderately extensive. They are distributed throughout the county but are of only minor importance to agriculture. More than half of the acreage has been cleared and is used primarily for pasture. In most wooded areas the trees are mainly yellow-poplar, gum, maple, and oaks that tolerate water.

Lawrence silt loam (Lr).—This nearly level, somewhat poorly drained, strongly acid soil has a fragipan. It is on the uplands. The following describes a typical profile:

0 to 9 inches, grayish-brown, friable silt loam.
9 to 22 inches, mottled, light yellowish-brown, pale-yellow, and light-gray silt loam that has moderate, blocky structure.
22 to 40 inches, mottled, light brownish-gray, light olive-brown, and pale-brown, brittle, compact silty clay loam pan; moderate, blocky structure.
40 to 78 inches +, mottled, light yellowish-brown, strong-brown, and light-gray silty clay that contains fragments of chert.

In places the texture in the upper part of the subsoil is silty clay loam. Depth to the fragipan ranges from approximately 12 to 25 inches. The layer under the pan varies in the content of chert, and its texture is silty clay or clay in places. Its color ranges from yellowish brown or brownish gray to yellowish red.

This soil has a moderately deep root zone. Runoff is slow. The soil is moderately wet and is moderately high in moisture-supplying capacity. Permeability is moderate in the surface layer and in the upper part of the subsoil and slow in the pan layer. The soil is medium in natural fertility, but it is low in content of organic matter. It is easy to till.

More than half of the acreage has been cleared and is used primarily for pasture. The trees are mainly yellow-poplar, gum, maple, and oaks that tolerate water. (Capability unit IIIw-1; woodland suitability group 14; wildlife productivity group 2.)

Lindside Series

The Lindside series consists of deep, moderately well drained, slightly acid or medium acid soils of the first bottoms. The soils have a surface layer of dark-brown silt loam and a subsoil of dark grayish-brown silt loam. They are mottled at a depth below 18 to 30 inches. These soils formed in recent alluvium washed primarily from soils that originated from limestone. In some places they have been influenced to some extent by sandstone and shale.

The Lindside soils are near the Huntington, Staser, Newark, and Melvin soils. They are less well drained than the Huntington and Staser soils, but they are better drained than the Newark and Melvin soils.

The Lindside soils occupy low areas along streams throughout the county, and they are subject to overflow. They are of moderate importance to agriculture. Nearly all of the acreage has been cleared and is used for row crops, hay, and pasture. Yields of most of the crops commonly grown in the county are good to excellent.

Lindside silt loam (Ls).—This is the only Lindside soil mapped in the county. It is a deep, moderately well drained, slightly acid or medium acid soil of the first bottoms. The following describes a typical profile:

0 to 18 inches, dark-brown, friable silt loam.
18 inches +, dark grayish-brown silt loam, mottled with grayish brown in the upper part, and brown, pale-brown, and gray, stratified alluvium in the lower part.

The depth to the mottled layer ranges from 18 to 30 inches.

This soil has very high moisture-supplying capacity and a deep root zone. It is high in natural fertility and medium in content of organic matter. Permeability is moderate. The soil is easy to till, and there is no hazard of erosion. It is subject to overflow, however, because it occurs in low positions along streams.

Nearly all of the acreage has been cleared and is used for cultivated crops. Yields of all the commonly grown crops are good to excellent.

Mapped with this soil are a few areas of a local alluvium phase of Lindside silt loam that occurs in upland depressions. This included soil developed in material of local origin. (Capability unit I-2; woodland suitability group 11; wildlife productivity group 1.)

Melvin Series

The Melvin series consists of poorly drained, medium or slightly acid soils of the flood plains. The surface layer of these soils is mottled and is dark grayish brown. Their subsoil is mottled and gray. The soils developed in alluvial material washed from soils that originated mainly from limestone but that contain a smaller amount of material from shale and sandstone. They are in nearly level areas or in depressions.

The Melvin soils are near the Huntington, Staser, Lindside, and Newark soils. They are more poorly drained and contain more mottles than any of those soils.

A small acreage of these soils occurs throughout the county. More than half of the acreage has been cleared and is used mainly for pasture. The trees in the forested areas are chiefly sycamore, gum, maple, beech, yellow-poplar, and oaks that tolerate water.

Melvin silt loam (Me).—This is the only Melvin soil mapped in the county. It is poorly drained and slightly acid, and it is on flood plains. The following describes a typical profile:

0 to 8 inches, dark grayish-brown, friable silt loam with a few strong-brown mottles.
8 to 18 inches, light olive-gray, friable silt loam or light silty clay loam mottled with strong brown, olive gray, and pale olive.
18 inches +, mottled, light olive-gray, strong-brown, and pale-olive, friable silt loam.

In places the surface layer is grayish brown. The lower part of the subsoil is extremely variable. In many places there are stratified layers of chert fragments, gravel, and sand, or a mixture of these materials, in the lower part of the subsoil.

This soil has a deep root zone. Its moisture-supplying capacity is very high, and its permeability is moderate. It is medium in natural fertility and low in content of organic matter. This soil is nearly level and is easy to till.

More than half of the acreage has been cleared and is used mainly for pasture, but some of it is idle. The trees that grow in forested areas are chiefly sycamore, gum, maple, beech, yellow-poplar, and oaks that tolerate water. (Capability unit IIIw-5; woodland suitabality group 15; wildlife productivity group 3.)

Mountview Series

The Mountview series consists of deep or moderately deep, well-drained, strongly acid soils of the uplands. The soils have a surface layer of light yellowish-brown to grayish-brown silt loam and a subsoil of yellowish-brown silt loam or silty clay loam. In the deeper Mountview soils, yellowish-red, yellowish-brown, light-gray, and pale-olive cherty clay is at a depth of approximately 34 inches. In the shallow soils bedrock or cherty clay is at a depth of approximately 20 inches. The Mountview soils developed partly in a mantle of silty material and partly in the underlying material weathered from cherty limestone.

The Mountview soils are near the Sango, Dickson, Frankstown, and Bewleyville soils. They lack the fragipan that is typical of the Sango and Dickson soils, and generally they are on more rolling uplands. The upper part of their profile contains more silt and less chert than that of the Frankstown soils. Their surface layer is more grayish than that of the Bewleyville soils, and their subsoil is yellowish brown.

The Mountview soils are widely distributed throughout the county. They are extensive and are important to agriculture. More than half of the acreage has been cleared and is used for general farm crops and pasture. Yields of corn, burley tobacco, hay, small grains, and pasture are fair. The most common kinds of trees in the wooded areas are oak, hickory, and yellow-poplar.

Mountview silt loam, 6 to 12 percent slopes (MoC).—This is a deep, well-drained, strongly acid soil of the uplands. The following describes a typical profile.

0 to 11 inches, light yellowish-brown or grayish-brown, friable silt loam that has granular structure in the upper part; light yellowish-brown to pale-brown, friable silt loam that has blocky structure in the lower part.
11 to 26 inches, yellowish-brown, friable silty clay loam with a few light-gray and pale-yellow mottles; moderate, blocky structure.
26 to 34 inches, yellowish-brown silty clay loam with light-gray and pale-yellow mottles; weak, blocky structure; contains few fragments of chert.
34 inches +, yellowish-red, yellowish-brown, light-gray, and pale-olive, firm cherty clay that has moderate, blocky structure.

In places the texture of the subsoil is silt loam. The color and texture, as well as the amount of chert in the lower part of the subsoil, vary from place to place. In places there is some chert in the upper part of the subsoil.

This soil has medium runoff, and there is a moderate hazard of erosion. The root zone is deep. The soil is very high in moisture-supplying capacity and moderate in permeability. The content of organic matter is medium, and natural fertility is moderately low. The soil is easy to work. Fair yields of corn, burley tobacco, hay, small grains, and pasture are obtained. Mapped with this soil is 26 acres of a heavy substratum variant of Mountview silt loam, which has a firmer and more clayey substratum than that described in the typical profile. (Capability unit IIIe-3; woodland suitability group 1; wildlife productivity group 2.)

Mountview silt loam, 2 to 6 percent slopes (MoB).—In places part of the original surface layer of this soil has been lost through erosion and the present surface layer is composed of a mixture of material from the original surface layer and the subsoil. The soil has medium to slow runoff. The hazard of erosion is moderately low.

Mapped with this soil is approximately 41 acres of a heavy substratum variant of Mountview silt loam and 12 acres of an eroded heavy substratum variant of Mountview silt loam. The substratum of these included soils is firmer and more clayey than that of the typical profile described for the series. (Capability unit IIe-5; woodland suitability group 1; wildlife productivity group 2.)

Mountview silt loam, 6 to 12 percent slopes, eroded (MoC2).—In most places part of the original surface layer of this soil has been lost through erosion and the present surface layer consists of a mixture of material from the original surface layer and the subsoil. In some areas most of the original surface layer has been lost and the present surface layer is composed primarily of material that was originally part of the subsoil. This soil is low in content of organic matter. It is high in moisture-supplying capacity.

Mapped with this soil is approximately 23 acres of an eroded heavy substratum variant of Mountview silt loam. The subsoil in the included areas is firmer and more clayey than that in the profile described as typical of the series. (Capability unit IIIe-3; woodland suitability group 1; wildlife productivity group 2.)

Mountview silt loam, shallow, 2 to 6 percent slopes (MsB).—The profile of this soil is similar to that of Mountview silt loam, 6 to 12 percent slopes, but this soil formed in a thinner mantle of silt, has a thinner surface layer and subsoil, and is underlain by bedrock or by material weathered from cherty limestone at a depth of approximately 20 inches. In places there is a thin, mottled layer above the bedrock. This soil has medium to slow runoff, a moderately deep root zone, and moderately high moisture-supplying capacity.

Mapped with this soil is approximately 261 acres of an eroded, shallow phase of Mountview silt loam that has lost part of the original surface layer through erosion. In the eroded areas the present surface layer is composed of a mixture of material from the original surface layer and the subsoil. (Capability unit IIIe–10; woodland suitability group 8; wildlife productivity group 2.)

Mountview silt loam, shallow, 6 to 12 percent slopes (MsC).—The profile of this soil is similar to that of Mountview silt loam, 6 to 12 percent slopes, but the soil formed in a thinner mantle of silt, has a thinner surface layer and subsoil, and is underlain by bedrock or by material weathered from cherty limestone at a depth of approximately 20 inches. In places there is a thin, mottled layer above the bedrock. The root zone is shallow to moderately deep, and the moisture-supplying capacity is moderately high. The hazard of further erosion is moderately severe. (Capability unit IVe–6; woodland suitability group 8; wildlife productivity group 2.)

Mountview silt loam, shallow, 6 to 12 percent slopes, eroded (MsC2).—The profile of this soil is similar to that of Mountview silt loam, 6 to 12 percent slopes, but this soil formed in a thinner mantle of silt, has a thinner surface layer and subsoil, and is underlain by bedrock or by material weathered from cherty limestone at a depth of approximately 20 inches. In most places part of the original surface layer has been removed by erosion and the present surface layer is composed of a mixture of material from the original surface layer and the subsoil. In places there is a thin, mottled layer above the bedrock. This soil is low in content of organic matter. It has a shallow root zone and moderately low moisture-supplying capacity. The hazard of further erosion is severe. (Capability unit IVe–6; woodland suitability group 8; wildlife productivity group 2.)

Mountview silt loam, shallow, 12 to 20 percent slopes (MsD).—This soil formed in a thinner mantle of silt and has a thinner surface layer and subsoil than Mountview silt loam, 6 to 12 percent slopes. It is underlain by bedrock or by material weathered from cherty limestone at a depth of approximately 20 inches. Runoff is medium to rapid. The root zone is shallow to moderately deep, and the moisture-supplying capacity is moderately high. The hazard of erosion is severe. (Capability unit VIe–1; woodland suitability group 9; wildlife productivity group 2.)

Mountview silt loam, shallow, 12 to 20 percent slopes, eroded (MsD2).—This soil formed in a thinner mantle of silt and has a thinner surface layer and subsoil than Mountview silt loam, 6 to 12 percent slopes. It is underlain by bedrock or by material weathered from cherty limestone at a depth of approximately 20 inches. In most places part of the original surface layer has been removed by erosion and the present surface layer is composed of a mixture of material from the original surface layer and the subsoil. Runoff is medium to rapid on this soil, and the hazard of further erosion is severe. The root zone is variable in depth. The soil is low in content of organic matter. (Capability unit VIe–1; woodland suitability group 9; wildlife productivity group 2.)

Muskingum Series

The Muskingum series consists of excessively drained, medium or strongly acid soils that are shallow over bedrock. The soils have moderately steep slopes and are on the uplands. They have a surface layer of pale-brown to light yellowish-brown very fine sandy loam and a subsoil of yellowish-brown sandy clay loam. These soils developed in material weathered from siltstone and sandstone.

The Muskingum soils occur with the Bodine and Westmoreland soils. They are more sandy than the Bodine soils, and they lack the chert that is typical of those soils. Their profile is more acid and more sandy throughout than that of the Westmoreland soils, and they developed in a different kind of parent material.

These soils occur primarily in the northern part of the county. They occupy only a small acreage and are not used extensively for agriculture. Nearly all of the acreage is in forest. The most common trees are oak and hickory.

Muskingum very fine sandy loam, 18 to 30 percent slopes (MuE).—This is the only Muskingum soil mapped in the county. It is excessively drained, medium or strongly acid, and shallow over bedrock. This soil is on the uplands. The following describes a typical profile:

0 to 8 inches, pale-brown, very friable very fine sandy loam in the upper part; brown to light yellowish-brown very fine sandy loam that has weak, blocky structure and contains a few fragments of sandstone in the lower part.

8 to 23 inches, yellowish-brown fine sandy clay loam that has weak, blocky structure; common fragments of sandstone that are more numerous with increasing depth.

23 inches +, weathered, fine-grained sandstone and siltstone.

This soil varies mainly in depth to bedrock and in the number of sandstone fragments scattered throughout the profile. Occasional outcrops of sandstone and some fragments of sandstone are on the surface.

Runoff is rapid on this soil, and the moisture-supplying capacity is moderately low. The soil has a moderately deep root zone and rapid permeability. Workability is hindered by the strong slopes and by the fragments of sandstone.

Nearly all of the acreage is in forest. The most common trees are oak and hickory. (Capability unit VIIe–1; woodland suitability group 9; wildlife productivity group 3.)

Needmore Series

The Needmore series consists of moderately deep, well-drained, strongly acid soils of the uplands. The surface layer of these soils is dark-brown to light olive-brown silt loam, and their subsoil is strong-brown to yellowish-brown and yellowish-red, clayey material. The soils developed in material weathered from shale. They are gently to strongly sloping and are underlain by acid to weakly calcareous shale at a depth of approximately 2½ feet.

The Needmore soils occupy areas near the Westmoreland, Caneyville, Christian, and Mountview soils. They are more strongly acid, have a firmer, more clayey subsoil, and are deeper over bedrock than the Westmoreland soils. The Needmore soils are shallower over bedrock and have thinner horizons than the Caneyville and Christian soils, and they have not been influenced by sandstone and

limestone. They generally have thinner horizons than the Mountview soils. The Needmore soils also have a firmer and more clayey subsoil than the Mountview soils, and they lack the mantle of silt that is typical of those soils.

The Needmore soils are not extensive, but they are widely distributed over the uplands. More than half of the acreage has been cleared and is used primarily for hay and pasture. Some areas are used to grow corn and tobacco, and some are idle. In forested areas the most common trees are locust, redcedar, oak, and hickory.

Needmore silt loam, 6 to 12 percent slopes (NdC).—This well-drained, strongly acid soil of the uplands is moderately deep over bedrock. The following describes a typical profile:

0 to 7 inches, brown, friable silt loam that has weak, granular structure.
7 to 14 inches, strong-brown, firm clay that has blocky structure; hard when dry, sticky and plastic when wet.
14 to 30 inches, yellowish-red, strong-brown, and yellowish-brown clay that has moderate, blocky structure in the upper part; light olive-brown, olive, strong-brown, and yellowish-brown, plastic, tough clay that has blocky structure in the lower part; very hard when dry, sticky and plastic when wet.
30 inches +, weathered, acid to weakly calcareous shale.

In places the surface layer is dark grayish brown. In some places the subsoil is yellowish brown or, in a few places, light olive brown. In places a few fragments of chert and sandstone occur throughout the profile, and in some places shale is nearer the surface than it is in the profile described as typical for the series.

This soil has medium runoff, and the hazard of erosion is moderately severe. The soil has moderately low moisture-supplying capacity. It has a moderately deep root zone. Permeability is moderately slow. The soil is low in content of organic matter and moderately low in natural fertility. It is easy to work.

Most of the acreage has been cleared and is used primarily for hay and pasture. Some areas, however, are used to grow corn and tobacco, and some are idle. (Capability unit IVe-8; woodland suitability group 4; wildlife productivity group 2.)

Needmore silt loam, 2 to 6 percent slopes (NdB).—The profile of this soil is similar to that of Needmore silt loam, 6 to 12 percent slopes, but this soil is gently sloping and has medium to slow runoff. The moisture-supplying capacity is moderately high. (Capability unit IIIe-14; woodland suitability group 4; wildlife productivity group 2.)

Needmore silty clay loam, 2 to 6 percent slopes, eroded (NfB2).—In most places part of the original surface layer of this soil has been lost through erosion. In these places the present surface layer consists of a mixture of material from the original surface layer and from the clayey subsoil. The soil is similar to Needmore silt loam, 6 to 12 percent slopes, but it has a shallow root zone and is somewhat less easy to work. The hazard of further erosion is moderate. (Capability unit IIIe-14; woodland suitability group 4; wildlife productivity group 2.)

Needmore silty clay loam, 6 to 12 percent slopes, eroded (NfC2).—In most places part of the original surface layer of this soil has been lost through erosion. In these places the present surface layer consists of a mixture of material from the original surface layer and the clayey subsoil. In some places all of the present surface layer consists of clayey material that was originally part of the subsoil. This soil is similar to Needmore silt loam, 6 to 12 percent slopes, but it has a shallow root zone, is low in moisture-supplying capacity, and is less easy to work. (Capability unit IVe-8; woodland suitability group 4; wildlife productivity group 3.)

Needmore silty clay loam, 12 to 20 percent slopes, eroded (NfD2).—In most places part of the original surface layer of this soil has been removed by erosion and the present surface layer consists of a mixture of material from the original surface layer and the clayey subsoil. In some places all of the original surface layer has been lost and the present surface layer is clayey material that was formerly part of the subsoil.

This soil has rapid runoff and very low moisture-supplying capacity. Its root zone is shallow, and the hazard of further erosion is severe. This soil is less easy to work than Needmore silt loam, 6 to 12 percent slopes.

Mapped with this soil are a few areas of a soil that is not eroded. (Capability unit VIe-1; woodland suitability group 5; wildlife productivity group 3.)

Needmore silty clay, 8 to 20 percent slopes, severely eroded (NeD3).—In most places nearly all of the original surface layer of this soil has been lost through erosion and the present surface layer consists mostly of clayey material from the original subsoil. This soil has rapid runoff and very low moisture-supplying capacity. It has a shallow root zone and is very low in content of organic matter. The soil is difficult to work, and the hazard of further erosion is severe. (Capability unit VIIe-2; woodland suitability group 7; wildlife productivity group 3.)

Newark Series

The Newark series consists of somewhat poorly drained, slightly acid soils of the flood plains. The soils have a dark grayish-brown surface layer and a grayish-brown to dark grayish-brown, mottled subsoil that overlies stratified alluvium. They developed in alluvium washed mainly from soils that originated from limestone but partly from soils that originated from sandstone and acid, calcareous shale.

The Newark soils are nearly level, and they occur with the Melvin, Lindside, Huntington, and Staser soils. They are better drained than the Melvin soils. The Newark soils are more poorly drained than the Lindside, Huntington, and Staser soils.

The Newark soils are along streams throughout the county. They are moderately extensive and are of moderate importance to agriculture. Nearly all of the acreage is used for hay and pasture, but some corn is grown. If the soils are properly drained, yields of corn are good to excellent.

Newark silt loam (Nk).—This is a nearly level, somewhat poorly drained, slightly acid soil of the flood plains. The following describes a typical profile:

0 to 10 inches, dark grayish-brown, friable silt loam that has granular structure.
10 to 18 inches, grayish-brown, friable silt loam with common mottles of brownish gray and light gray; granular structure.
18 to 28 inches, grayish-brown silt loam with mottles of gray and yellowish brown; contains a few dark-brown concretions; massive.
28 inches +, gray silt loam with mottles of grayish brown and yellowish brown; contains small, dark-brown concretions.

Stratified gravel, sand, and fragments of chert occur in some areas. The stratified material is at a depth of 2½ to 3 feet.

This soil has slow runoff and moderate permeability. It is subject to overflow. Its root zone is deep, and its moisture-supplying capacity is very high. The soil is moderate in natural fertility and medium in content of organic matter.

If this soil is properly drained, it is easy to work. Good to excellent yields of the commonly grown crops are obtained in areas that are properly drained.

Mapped with this soil are a few areas of another loamy soil. The included areas are too small to be mapped separately. (Capability unit IIw–4; woodland suitability group 15; wildlife productivity group 2.)

Newark gravelly silt loam (Ng).—The profile of this soil is more grayish than that of Newark silt loam, and it contains more sand and gravel. It also has slightly better internal drainage and a moderately deep root zone. This soil is slightly acid or medium acid. It is less productive of the commonly grown crops than Newark silt loam, and it is more difficult to work.

Mapped with this soil is a small acreage in which the texture of the surface layer is gravelly loam. (Capability unit IIw–6; woodland suitability group 15; wildlife productivity group 2.)

Pembroke Series

The Pembroke series consists of well-drained soils that are medium acid. The soils have a thick surface layer that is dark brown to dark reddish brown, and a mellow, clayey subsoil that is reddish brown to dark red. These soils are gently sloping or sloping. They developed in a thin or discontinuous layer of loess over red residuum from limestone.

The Pembroke soils are near the Bewleyville, Cookeville, Baxter, and Christian soils. They have a darker colored surface layer than any of those soils, and the upper part of their subsoil is more reddish than that of the Bewleyville soils. The upper part of the subsoil in the Pembroke soils is more friable than that of the Cookeville, Baxter, and Christian soils, and the Pembroke soils formed partly in more silty material.

The Pembroke soils occur primarily in the central part of the county. They are among the most productive soils of the uplands in the county, and nearly all of the acreage is used for crops. Yields of corn, burley tobacco, small grains, clover, and other crops are excellent.

Pembroke silt loam, 2 to 6 percent slopes (PmB).—This is a well-drained, medium acid soil of the uplands. The following describes a typical profile:

0 to 11 inches, dark-brown, very friable silt loam that has granular structure in the upper part; reddish-brown silt loam to silty clay loam that has blocky structure in the lower part.

11 to 38 inches, dark reddish-brown, friable silty clay loam that has blocky structure in the upper part; reddish-brown, firm silty clay that has streaks of yellowish brown and blocky structure in the lower part.

38 inches +, dark-red to dark reddish-brown, firm silty clay that has streaks of yellowish brown and blocky structure; contains few, finely divided fragments of chert.

In places the surface layer is dark reddish brown. In the areas where erosion has removed part of the original surface layer, the plow layer now consists of a mixture of material from the original surface layer and from the upper part of the subsoil.

This soil has a deep root zone, very high moisture-supplying capacity, and moderate permeability. Runoff is medium to slow. The soil is high in natural fertility and medium to high in content of organic matter. It is easy to work, and the hazard of erosion is moderately low. (Capability unit IIe–1; woodland suitability group 1; wildlife productivity group 1.)

Pembroke silt loam, 6 to 12 percent slopes (PmC).—This soil has medium runoff. The hazard of erosion is moderate.

Mapped with this soil is 215 acres of an eroded Pembroke silt loam. In the eroded areas the present surface layer consists of a mixture of material from the original surface layer and the subsoil. A small acreage of a severely eroded Pembroke silty clay loam is also included. Here the plow layer is composed primarily or wholly of red clay subsoil material. (Capability unit IIIe–1; woodland suitability group 1; wildlife productivity group 1.)

Robertsville Series

The Robertsville series consists of poorly drained, strongly acid soils that have a fragipan. The surface layer and the upper part of the subsoil are gray or grayish-brown, mottled silt loam, which overlies a layer of light-gray, mottled, compact silty clay loam. These soils developed in old alluvium washed primarily from soils of limestone origin, but partly from material of shale and sandstone origin. They are nearly level and occur in slight depressions.

The Robertsville soils are near the Taft, Captina, Landisburg, and Humphreys soils. They are less well drained than any of those soils. They are also more grayish throughout and are in lower positions.

The Robertsville soils are along the Green River and the larger creeks. They are moderately extensive but are of only limited importance to agriculture. Almost half of the acreage remains in trees; the most common trees are gum, sycamore, beech, and oaks that tolerate water. The acreage that has been cleared is used primarily for pasture. In areas used for crops, yields are low or very low.

Robertsville silt loam (Rb).—This is the only Robertsville soil mapped in the county. It is a poorly drained, strongly acid soil that has a fragipan. It occurs on stream terraces. The following describes a typical profile:

0 to 5 inches, grayish-brown silt loam with yellowish-brown mottles; granular structure.

5 to 14 inches, mottled, olive-gray and olive-yellow silt loam that has weak, blocky structure.

14 to 40 inches, mottled, light-gray, yellowish-brown, and pale-olive silty clay loam; firm, brittle, and compact; weak, blocky structure.

40 inches +, light-gray silty clay loam mottled with strong brown and pale olive; blocky structure; contains some gravel.

In places the pan is at a greater depth than that in the profile described as typical of the series. In other places it is somewhat thinner than the one in the profile described.

This soil is nearly level. It has very slow runoff, a shallow root zone, and moderately low moisture-supplying capacity. The content of organic matter is low, and the soil is moderately low in natural fertility. Permeability is moderately slow in the surface layer and in the upper part of the subsoil, and it is slow in the pan layer. This soil is wet most of the time, but it is easy to work otherwise. Because of poor drainage, this soil is not well suited to cultivated crops. (Capability unit IVw-1; woodland suitability group 15; wildlife productivity group 3.)

Rockcastle Series

The Rockcastle series consists of strongly acid, excessively drained soils that are shallow over shale bedrock. The soils are on the uplands. They have a surface layer of grayish-brown to yellowish-brown silt loam and a subsoil of mottled, olive-gray shaly silty clay. The soils developed in material weathered from acid, gray, soft shale. They are strongly sloping to steep.

The Rockcastle soils occur with the Westmoreland, Colyer, and Bodine soils. They are more acid than the Westmoreland soils, and they formed in more acid parent material. They lie above the Colyer soils and developed in material weathered from acid, gray, soft shale rather than from black, fissile shale. Their subsoil is less reddish than that of the Colyer soils. The Rockcastle soils are shallower over bedrock than the Bodine soils, and they are more grayish throughout than those soils. They also have a finer textured subsoil and lack chert in their profile.

Small areas of the Rockcastle soils occur throughout the northern part of the county, but these soils are of limited extent and are of minor importance to agriculture. Most of the acreage remains in trees, but a few small areas are used for cultivated crops and pasture. The yields are extremely low. Most of the areas that have been cleared are now idle and are gradually reverting to forest. The most common kinds of trees are oak and hickory.

Rockcastle silt loam, 20 to 30 percent slopes (RcE).—This is an excessively drained, strongly acid soil of the uplands. The following describes a typical profile:

0 to 6 inches, thin, dark grayish-brown silt loam in the upper part; pale-olive or light yellowish-brown, mottled silt loam of blocky structure in the lower part.
6 to 15 inches, olive-gray shaly silty clay mottled with strong brown, pale yellow, and light gray; blocky structure.
15 inches +, gray, pale-olive, and bluish-gray, acid clay shale.

The color, texture, and depth of the layers vary greatly within short distances. In places there are large pieces of shale in the surface layer.

This soil has very rapid runoff, very low moisture-supplying capacity, and a shallow root zone. It is low in content of organic matter, slow in permeability, and low in natural fertility. The hazard of erosion is severe. This soil is probably best suited to trees or pasture.

Mapped with this soil is approximately 24 acres of an eroded Rockcastle shaly silty clay. In these areas erosion has removed part of the original surface layer and the present surface layer is composed of a mixture of material from the original surface layer and the subsoil. (Capability unit VIIe-2; woodland suitability group 9; wildlife productivity group 3.)

Rockcastle silt loam, 12 to 20 percent slopes (RcD).—This soil has low moisture-supplying capacity. Runoff is rapid.

Mapped with this soil is about 95 acres of an eroded Rockcastle shaly silty clay. In eroded areas part of the original surface layer has been lost, and in these places the present surface layer consists of a mixture of material from the original surface layer and the subsoil. (Capability unit VIe-8; woodland suitability group 9; wildlife productivity group 3.)

Rockcastle silt loam, 30 to 40 percent slopes (RcF).—The profile of this soil is similar to that of Rockcastle silt loam, 20 to 30 percent slopes, but this soil has stronger slopes and the hazard of erosion is very severe.

Mapped with this soil is approximately 32 acres of an eroded Rockcastle shaly silty clay. In the eroded areas part of the original surface layer has been lost and the present surface layer is a mixture of material from the original surface layer and the subsoil. (Capability unit VIIe-2; woodland suitability group 9; wildlife productivity group 3.)

Rock Land

This miscellaneous land type consists largely of areas of rock outcrops. The outcrops make up from 25 to 90 percent of the surface area.

Rock land (Rk).—This land type consists mainly of limestone outcrops. The areas are adjacent to the very rocky Christian, Caneyville, and Talbott soils. The soil profiles between the outcrops are similar to the profiles of the adjacent soils.

This land type is mostly in areas of woodland. The most common kinds of trees that grow on it are hickory, oak, and redcedar. (Capability unit VIIs-5; woodland suitability group 7; wildlife productivity group 3.)

Rock Outcrop

This miscellaneous land type consists of areas in which rock outcrops occupy more than 90 percent of the surface area. Vegetation is sparse on these areas.

Rock outcrop (Ro).—Limestone makes up approximately 75 percent of the rocks in this land type. The rest consists of exposed, weathered shale.

The areas of this land type are small, and they occur throughout the county. Most of the areas have no vegetation, but a few scrubby trees grow on some of them. (Capability unit VIIIs-1; not placed in a woodland suitability group; wildlife productivity group 3.)

Sango Series

The Sango series consists of moderately well drained, strongly acid soils that have a fragipan. The soils have a surface layer of grayish-brown silt loam. The upper part of their subsoil is yellowish-brown silt loam to silty clay loam. It overlies a highly mottled, compact layer of light-colored silt loam. These soils developed partly in silty material and partly in material weathered from cherty limestone. They are nearly level or gently sloping and are on the uplands.

These soils occur with the Guthrie, Lawrence, and Mountview soils. They are better drained and less mottled than the Guthrie and Lawrence soils, and they are

less well drained and more gently sloping than the Mountview soils.

The Sango soils are extensive and are widely distributed throughout the county. They are important to agriculture. Some areas are still in trees, but most of the acreage has been cleared and is used for farm crops, including corn, tobacco, small grains, hay, and pasture plants. The kinds of trees that are the most common are oak, gum, maple, and yellow-poplar.

Sango silt loam, 0 to 2 percent slopes (SaA).—This is a moderately well drained, strongly acid soil of the uplands. The soil contains a fragipan. The following describes a typical profile:

0 to 9 inches, grayish-brown, very friable silt loam that has granular structure in the upper part; light yellowish-brown, friable silt loam that has granular structure in the lower part.
9 to 27 inches, yellowish-brown to light yellowish-brown silt loam or silty clay loam that has blocky structure.
27 to 38 inches, light olive-brown or pale-brown silt loam with mottles of gray, pale yellow, and brown; firm or brittle, compact; blocky structure.
38 inches +, chert beds that contain some yellowish-red, yellowish-brown, and gray silty clay loam and silty clay.

The depth to the fragipan is about 24 inches in most places, but it is as little as 20 inches in some places and as much as 30 inches in others. This soil has slow runoff and moderately high moisture-supplying capacity. It has a moderately deep root zone. Permeability is moderate in the surface layer and in the upper part of the subsoil, but it is slow in the pan layer. There is little or no hazard of erosion. The soil is low in content of organic matter and moderately low in natural fertility. It is easy to work and responds well if lime is added and proper kinds and amounts of fertilizer are applied.

The crops commonly grown on this soil are corn, tobacco, small grains, lespedeza, and pasture plants. Under good management, fair to good yields are obtained. (Capability unit IIw–2; woodland suitability group 10; wildlife productivity group 2.)

Sango silt loam, 2 to 6 percent slopes (SaB).—The profile of this soil is similar to that of Sango silt loam, 0 to 2 percent slopes, but this soil has stronger slopes and better surface drainage. Runoff is medium to slow. The hazard of erosion is moderately low.

Mapped with this soil is approximately 130 acres of an eroded Sango silt loam. In the eroded areas part of the original surface layer has been lost and the present surface layer consists of a mixture of material from the original surface layer and the subsoil. (Capability unit IIe–7; woodland suitability group 10; wildlife productivity group 2.)

Sequatchie Series

The Sequatchie series consists of well-drained, strongly acid, young soils that are nearly level. The soils have a dark-brown surface layer and a strong-brown subsoil. They developed in alluvium washed from soils of sandstone, shale, and limestone origin.

The Sequatchie soils are in low positions on stream terraces near the Staser, Huntington, Whitwell, Taft, and Landisburg soils. They are more acid than the Staser and Huntington soils, and their profile is better developed. The Sequatchie soils are better drained than the Whitwell soils. They are also better drained than the Taft and Landisburg soils, their profile is less well developed, and they lack the pan that is typical of those soils.

The Sequatchie soils occupy small areas along the Green River and other large streams. They are of only minor importance to agriculture. All of the acreage has been cleared, and good yields of the commonly grown cultivated crops are obtained.

Sequatchie silt loam, 0 to 4 percent slopes (SeB).—This is the only Sequatchie soil mapped in the county. It is a well-drained, young soil of stream terraces. The following describes a typical profile:

0 to 8 inches, dark-brown, very friable silt loam that has granular structure.
8 to 30 inches, strong-brown, friable to firm silty clay loam that has blocky structure.
30 inches +, dark-brown to yellowish-brown, stratified beds of sand, silt loam, and clay; no definite structure.

In some places stratified alluvium is at a greater depth than that in the profile described as typical for the series. In places there is some chert and gravel in the underlying material.

This soil has slow to medium runoff, a deep root zone, and very high moisture-supplying capacity. It is moderately high in natural fertility and medium in content of organic matter. The soil is easy to work, and there is no hazard of erosion. Permeability is moderately rapid.

All of this soil has been cleared. Good yields of the commonly grown cultivated crops are obtained. (Capability unit I–3; woodland suitability group 11; wildlife productivity group 1.)

Staser Series

The Staser series consists of well-drained, slightly acid or neutral soils of the flood plains. These soils developed in recent alluvium washed from soils of shale, sandstone, and limestone origin. They are nearly level.

The Staser soils occur with the Lindside, Newark, Melvin, Sequatchie, Whitwell, and Wolftever soils. They are better drained and less acid than the Lindside, Newark, Melvin, Whitwell, and Wolftever soils, and they lack the compact subsoil that is typical of the Wolftever soils. The Staser soils occupy lower positions than the Sequatchie soils, their profile is less developed, and they are less acid. They most closely resemble the Huntington soils, but they are lighter colored and have a higher component of material of shale and sandstone origin.

The Staser soils occur primarily along the Green River. They are important to agriculture. Nearly all of the acreage has been cleared, and most of it is used to grow corn. Yields of corn, soybeans, and hay are good to excellent on these soils.

Staser silt loam (St).—This is a well-drained, slightly acid or neutral soil of the flood plains. The following describes a typical profile:

0 to 10 inches, dark grayish-brown, very friable silt loam that has granular structure.
10 to 20 inches, grayish-brown to dark grayish-brown, friable silt loam or light silty clay loam that has granular structure.
20 inches +, grayish-brown, friable silt loam that has weak, granular structure.

In places sand and gravel are at a depth of 25 inches or more.

This soil has slow runoff and very high moisture-supplying capacity. The root zone is deep, and the soil is moderately high in natural fertility and medium in content of organic matter. It is easy to work, and there is no hazard of erosion. Permeability is moderate.

Nearly all of the acreage has been cleared and is used primarily to grow corn. Yields of corn, soybeans, and hay are good to excellent.

Mapped with this soil is a small acreage of a local alluvium phase of Staser silt loam that contains material of more local origin than does the typical soil. In places the included soil contains some gravel. (Capability unit I–1; woodland suitability group 11; wildlife productivity group 1.)

Staser loam (Sm).—The profile of this soil is similar to that of Staser silt loam, but it has a coarser texture. Permeability is moderately rapid.

Mapped with this soil is approximately 70 acres of a local alluvium phase of Staser loam that contains material of more local origin than the typical soil. (Capability unit I–1; woodland suitability group 11; wildlife productivity group 1.)

Staser gravelly loam (Sg).—The profile of this soil is similar to that of Staser silt loam, but it has a coarser texture and contains a large amount of gravel. It is moderately high in moisture-supplying capacity and moderate in natural fertility. Permeability is moderately rapid. This soil is somewhat difficult to till because of the content of gravel.

Mapped with this soil is approximately 628 acres of a local alluvium phase of Staser silt loam that contains material of more local origin than does the typical soil. (Capability unit IIs–1; woodland suitability group 11; wildlife productivity group 2.)

Taft Series

The Taft series consists of somewhat poorly drained, nearly level soils that have a fragipan. The surface layer of these soils is light olive gray to grayish brown. The upper part of the subsoil is mottled and is light yellowish brown to pale olive, and the lower part is mottled, olive gray, and compact. These soils developed in alluvium washed primarily from soils of limestone origin, but partly from soils of shale and sandstone origin.

These soils are on stream terraces near the Captina, Landisburg, Robertsville, and Wolftever soils. They are more poorly drained than the Captina and Landisburg soils, but they are better drained than the Robertsville soil. The Taft soils have a better developed profile than the Wolftever soils, and they are more poorly drained and have a fragipan.

The Taft soils are moderately extensive and occur throughout the county. Because of their poor drainage, these soils are used primarily for hay and pasture, but some areas remain in trees. Gum, maple, beech, yellow-poplar, and oaks that tolerate water are the most common trees.

Taft silt loam (Ta).—This is the only Taft soil mapped in the county. It is a somewhat poorly drained, nearly level soil of stream terraces, and it has a fragipan. The following describes a typical profile:

0 to 8 inches, grayish-brown, friable silt loam that has granular structure.
8 to 15 inches, pale-olive, friable silty clay loam mottled with olive gray and strong brown; weak, blocky structure.
15 to 40 inches, olive-gray, brittle, compact silty clay loam with strong-brown and yellowish-brown mottles; moderate, blocky structure.
40 inches +, stratified layers of gravel and fragments of chert, interlaced with soil material.

The amount of chert and gravel throughout the profile varies. The color of the surface layer ranges from light olive gray to dark grayish brown. The upper part of the subsoil ranges from yellowish brown to pale olive.

Runoff is slow on this soil, and there is no hazard of erosion. The soil has a moderately deep root zone and moderately high moisture-supplying capacity. It is moderately low in natural fertility and low in content of organic matter. The soil is easy to work. Permeability is moderate in the surface layer and in the upper part of the subsoil and slow in the pan layer.

Most of the acreage has been cleared. It is used primarily for pasture and hay. (Capability unit IIIw–1; woodland suitability group 15; wildlife productivity group 2.)

Talbott Series

The Talbott series consists of well-drained, strongly acid soils of the uplands. In areas that are not eroded, the surface layer is yellowish-brown silt loam and the subsoil is yellowish-red, very firm, plastic clay. These soils developed in material weathered from argillaceous limestone. Rock outcrops are common on the steeper slopes; they are more extensive where severe erosion has taken place. The soils are sloping to moderately steep.

The Talbott soils occur with the Caneyville, Needmore, Baxter, and Westmoreland soils. Their subsoil is firmer and more plastic than that of the Caneyville soils, and they contain less sand than those soils. They have a thicker profile and a more reddish subsoil than the Needmore soils, and they lack the influence of shale. The Talbott soils have a less cherty, more clayey subsoil than the Baxter soils. They are more acid than the Westmoreland soils, and they have a more reddish subsoil and a thicker, better developed profile.

Most of the acreage of the Talbott soils has been cleared, although some of it remains in trees. The trees are mainly oak and hickory. The acreage that has been cleared is used primarily for hay and pasture, but some of it is idle.

Talbott silt loam, 6 to 12 percent slopes, eroded (TbC2).—This is a well-drained, strongly acid soil of the uplands. In most places it has lost part of the original surface layer through erosion, and material that was formerly part of the subsoil has been mixed into the present surface layer by tillage. This soil has a red, clayey, plastic subsoil. The following describes a typical profile:

0 to 7 inches, dark yellowish-brown, friable silt loam that has granular structure.
7 to 36 inches, yellowish-red clay with yellow and gray mottles, which are more abundant with increasing depth; strong, blocky structure; very firm when moist, sticky and plastic when wet, hard when dry.
36 to 48 inches +, red, reddish-yellow, and light brownish-gray clay; massive; very firm when moist, sticky and plastic when wet, hard when dry.

In places there is a thin layer of silty clay loam beneath the surface layer. Depth to bedrock ranges from 3 to 10 feet or more.

Runoff on this soil is medium to rapid. The soil has a moderately deep root zone and moderately high moisture-supplying capacity. It is moderate in natural fertility, low in content of organic matter, and moderately slow in permeability. The soil is easy to work, but the hazard of further erosion is moderately severe.

Mapped with this soil is a small acreage of a soil that is not eroded. In the included areas the clayey subsoil is at a slightly greater depth than in the typical profile. (Capability unit IVe-8; woodland suitability group 4; wildlife productivity group 2.)

Talbott very rocky silt loam, 12 to 20 percent slopes, eroded (TrD2).—The profile of this soil is similar to that of Talbott silt loam, 6 to 12 percent slopes, eroded, but 10 to 25 percent of the surface is covered by outcrops of limestone. Erosion has removed part of the original surface layer, and cultivation has caused some material that was formerly in the subsoil to be mixed into the present surface layer. In places all of the present surface layer consists of red, clayey material that was originally part of the subsoil.

This soil has rapid runoff, low moisture-supplying capacity, and a shallow to moderately deep root zone. The hazard of further erosion is severe. Because of the outcrops of limestone and the content of rock, this soil is difficult to work.

Mapped with this soil is a small acreage of a soil that is not eroded. In the included areas the clayey subsoil is at a slightly greater depth than in the typical profile. (Capability unit VIs-1; woodland suitability group 5; wildlife productivity group 3.)

Talbott very rocky silty clay, 12 to 20 percent slopes, severely eroded (TvD3).—The profile of this soil is similar to that of Talbott silt loam, 6 to 12 percent slopes, eroded, but the surface layer is more reddish and finer textured. Outcrops of limestone occupy from 10 to 25 percent of the surface. In many places erosion has removed most of the original surface layer and the present surface layer consists of red, clayey material that was formerly part of the subsoil.

This soil has rapid runoff, a shallow root zone, and very low moisture-supplying capacity. It is very low in content of organic matter. The hazard of further erosion is severe. (Capability unit VIIs-2; woodland suitability group 7; wildlife productivity group 3.)

Talbott very rocky silt loam, 20 to 30 percent slopes, eroded (TrE2).—The profile of this soil is similar to that of Talbott silt loam, 6 to 12 percent slopes, eroded, but 10 to 25 percent of the surface is covered by outcrops of limestone. Erosion has removed part of the original surface layer, and cultivation has caused some material that was formerly in the subsoil to be mixed into the present surface layer. In places all of the present surface layer consists of red, clayey material that was originally part of the subsoil.

This soil has a moderately deep to shallow root zone and low moisture-supplying capacity. The hazard of further erosion is severe. The soil is somewhat difficult to work because of the steep slope, the numerous outcrops, and the content of rock.

Mapped with this soil is a small acreage of a soil that is not eroded. In the included areas the red, clayey subsoil is at a somewhat greater depth than in the typical profile. (Capability unit VIIs-2; woodland suitability group 5; wildlife productivity group 3.)

Talbott very rocky silty clay, 20 to 30 percent slopes, severely eroded (TvE3).—The profile of this soil is similar to that of Talbott silt loam, 6 to 12 percent slopes, eroded, but the surface layer is clayey and more reddish. From 10 to 25 percent of the surface is covered by outcrops of limestone. In most places erosion has removed most of the original surface layer and the present surface layer consists of red, clayey material that was formerly part of the subsoil.

This soil has very rapid runoff, and the hazard of further erosion is very severe. The root zone is shallow, and the moisture-supplying capacity is very low. The soil is also very low in content of organic matter. It is difficult to work because of the large amount of clay in the surface layer, the outcrops of rock, and the steep slope. (Capability unit VIIs-2; woodland suitability group 7; wildlife productivity group 3.)

Westmoreland Series

The Westmoreland series consists of somewhat excessively drained, slightly acid or neutral soils of the uplands. These soils are shallow over shale bedrock. In areas that are not eroded, their surface layer is grayish-brown shaly silt loam and their subsoil is yellowish-brown shaly silty clay loam. The soils developed mainly in material weathered from calcareous shale, but partly in material weathered from limestone. They are gently sloping to very steep.

The Westmoreland soils occur with the Caneyville, Mountview, Rockcastle, Bodine, and Muskingum soils. They are less acid than the Caneyville soils, their subsoil is less reddish and less clayey, and they are shallower over bedrock. They are less acid and shallower over bedrock than the Mountview soils, they have a finer textured subsoil, and they developed in a different kind of parent material. The Westmoreland soils are less acid and more brownish than the Rockcastle soils, and they developed mainly in material from calcareous shale rather than in material from acid shale. They resemble the Muskingum soils to some extent, but they are less acid and finer textured and they developed mainly in material weathered from shale rather than from sandstone. They are more acid, contain more shale, and have less chert than the Bodine soils.

The Westmoreland soils are extensive, but they are only moderately important to agriculture. Approximately two-thirds of the acreage remains in trees, mainly oaks, hickory trees, and redcedars. The areas that have been cleared are used primarily for hay and pasture, but a small acreage is used to grow corn and tobacco. Many of the areas where erosion is severe are idle or have reforested to redcedar.

Westmoreland shaly silt loam, 12 to 20 percent slopes (WeD).—This is a somewhat excessively drained, slightly acid or neutral soil of the uplands. It is shallow over shale bedrock. The following describes a typical profile:

0 to 10 inches, dark grayish-brown, friable shaly silt loam of granular structure in the upper part, and yellowish-brown, firm shaly silty clay loam of weak, blocky structure in the lower part.
10 to 20 inches, yellowish-brown, firm shaly silty clay loam that has moderate, blocky structure; fragments of shale more abundant with increasing depth.
20 inches +, weathered, calcareous shale.

In some places weathered shale is a few inches deeper or shallower than described in the typical profile. The content of shale varies throughout the profile.

Runoff is rapid on this soil, and the hazard of erosion is severe. The soil is low in moisture-supplying capacity and has a shallow root zone. It is moderately low in inherent fertility, medium in content of organic matter, and moderate in permeability. The soil is somewhat difficult to till because of the content of shale.

Approximately two-thirds of the acreage is in trees. Areas that have been cleared are used primarily for pasture and hay. (Capability unit VIe 8; woodland suitability group 9; wildlife productivity group 3.)

Westmoreland shaly silt loam, 2 to 6 percent slopes (WeB).—The profile of this soil is similar to that of Westmoreland shaly silt loam, 12 to 20 percent slopes, but in most places shale bedrock is at a slightly greater depth. Runoff is medium, and the moisture-supplying capacity is moderately high. The hazard of erosion is moderately low. (Capability unit IIIe–13; woodland suitability group 8; wildlife productivity group 2.)

Westmoreland shaly silt loam, 6 to 12 percent slopes (WeC).—Where this soil has been cultivated, slight erosion has removed part of the original surface layer. As a result, shale bedrock is nearer the surface than in areas that have not been cultivated. Runoff is medium on this soil. The hazard of erosion is moderate. (Capability unit IVe 6; woodland suitability group 8; wildlife productivity group 3.)

Westmoreland shaly silt loam, 20 to 30 percent slopes (WeE).—The profile of this soil is similar to that of Westmoreland shaly silt loam, 12 to 20 percent slopes, but in most places shale bedrock is nearer the surface. Runoff is very rapid. (Capability unit VIIe–2; woodland suitability group 9; wildlife productivity group 3.)

Westmoreland shaly silt loam, 30 to 55 percent slopes (WeF).—The profile of this soil is similar to that of Westmoreland shaly silt loam, 12 to 20 percent slopes, but in most places shale bedrock is nearer the surface. In some places, however, there is a thin layer of soil material from the slopes above that has been deposited over this soil as the result of soil creep. In those areas of soil creep, bedrock is at a slightly greater depth.

This soil has very rapid runoff and very low moisture-supplying capacity. The hazard of erosion is very severe. Nearly all of the acreage is in trees. (Capability unit VIIe–2; woodland suitability group 9; wildlife productivity group 3.)

Westmoreland shaly silty clay loam, 12 to 30 percent slopes, severely eroded (WmE3).—The profile of this soil is similar to that of Westmoreland shaly silt loam, 12 to 20 percent slopes, but the surface layer is finer textured and bedrock is nearer the surface. Erosion has removed most of the original surface layer, and the present surface layer is made up mainly of material that was formerly part of the subsoil. In some places shale bedrock is exposed.

Runoff is very rapid on this soil, and the hazard of further erosion is very severe. The root zone is very shallow. This soil is very low in moisture-supplying capacity and very low in content of organic matter. It is difficult to work. Most of the acreage is either idle or has reforested to redcedar. (Capability unit VIIe–3; woodland suitability group 6; wildlife productivity group 3.)

Westmoreland shaly silty clay loam, 30 to 50 percent slopes, severely eroded (WmF3).—The profile of this soil is similar to that of Westmoreland shaly silt loam, 12 to 20 percent slopes, but the surface layer is finer textured and this soil is shallower over bedrock. Erosion has removed most of the original surface layer, and the present surface layer consists mainly of material that was formerly part of the subsoil. In some places the shale bedrock is exposed.

Runoff is very rapid. This soil has a shallow root zone and very low moisture-supplying capacity. It is very low in content of organic matter. It is difficult to work, and the hazard of further erosion is very severe. Most of the acreage is either idle or has reforested to redcedar. (Capability unit VIIe–3; woodland suitability group 6; wildlife productivity group 3.)

Whitwell Series

The Whitwell series consists of somewhat poorly drained or moderately well drained, strongly acid, young soils of stream terraces. These soils have a surface layer of dark-brown silt loam and a subsoil of brown, mottled silt loam or silty clay loam. They developed in alluvium washed from soils of shale, sandstone, and limestone origin. The soils are nearly level.

The Whitwell soils occur with the Staser, Lindside, Newark, Taft, and Sequatchie soils. They are more poorly drained and have a better developed profile than the Staser and Lindside soils. Their profile is better developed than that of the Newark soils, and in places they are somewhat better drained. The Whitwell soils are somewhat better drained than the Taft soils, and they lack a fragipan. They are more poorly drained than the Sequatchie soils, their profile is more grayish throughout, and they are in lower positions on the stream terraces.

The Whitwell soils are along the Green River and other large streams. They are of minor extent and are of minor importance to agriculture. Nearly all of the acreage, however, is used for row crops, hay, and pasture.

Whitwell silt loam (Wt).—This is the only Whitwell soil mapped in the county. It is a somewhat poorly drained to moderately well drained, strongly acid soil on stream terraces. The following describes a typical profile:

0 to 13 inches, dark-brown silt loam of granular structure in the upper part, and brown silt loam of blocky structure in the lower part.
13 to 36 inches, brown silt loam to silty clay loam mottled with light gray and strong brown; blocky structure.
36 inches +, mottled, light yellowish-brown and gray silt loam; contains some sand and gravel.

In some places the depth to mottling is somewhat less than in the typical profile.

This nearly level, somewhat wet soil has slow runoff, a deep root zone, and very high moisture-supplying capacity. It is medium in content of organic matter, medium in natural fertility, and moderate in permeability. The soil is easy to work. (Capability unit IIw–4; woodland suitability group 11; wildlife productivity group 2.)

Wolftever Series

The Wolftever series consists of moderately well drained or well drained, strongly acid, young soils of stream terraces. The soils have a surface layer of dark grayish-brown silt loam and a subsoil of brown, compact silty clay loam. They developed in alluvium washed from soils of limestone, shale, and sandstone origin. The soils are nearly level.

The Wolftever soils occur with the Huntington, Staser, Lindside, and Newark soils. They are slightly less well drained than the Huntington and Staser soils, their profile is better developed, and they have a more compact subsoil. The Wolftever soils are better drained than the Lindside and Newark soils, their profile is better developed, and they have a more compact subsoil.

The Wolftever soils occupy small areas along the Green River and the larger creeks. They are not extensive and are of only minor importance to agriculture. Most of the acreage is used to grow row crops. Yields of corn and hay are good to excellent.

Wolftever silt loam (Wv).—This is the only Wolftever soil mapped in the county. It is moderately well drained or well drained and is strongly acid. Its subsoil is compact. The following describes a typical profile.

0 to 8 inches, dark grayish-brown, friable silt loam that has granular structure.
8 to 38 inches, brown, firm, compact silty clay loam with few olive-gray and strong-brown mottles; moderate, blocky structure.
38 inches +, compact silty clay loam mottled with olive gray, yellowish brown, and strong brown.

The degree of mottling and compaction in the upper part of the subsoil varies.

Runoff is slow on this soil. There is no hazard of erosion. The soil has very high moisture-supplying capacity and a deep root zone. It is medium in natural fertility and in content of organic matter, and it is easy to work. Permeability is moderately slow. (Capability unit IIw–1; woodland suitability group 11; wildlife productivity group 2.)

Use and Management of Soils

This section first describes some basic practices of management for soils used for cultivated crops. Then the system of capability grouping is defined and the use and management of the soils in each capability unit are discussed. Following this are estimated average yields of principal crops under a defined high level of management, and then, use and management of the soils for woodland and wildlife. Finally, facts are given about the use of soils in engineering.

General Management

The major problems in managing the soils of Adair County are controlling erosion, increasing productivity, and reducing wetness.

Runoff must be controlled so that the soil material is not washed away. If runoff is slowed, soil erosion is reduced and more water soaks into the soil. Proper use of the soils, including use of a sod crop in the rotation, leaving crop residues on the surface, cultivating on the contour, and using terraces, diversion ditches, and stripcropping are some of the practices that help control runoff and reduce erosion.

Productivity varies according to the present and past management and the natural fertility of each soil. Fertilizer should be applied on all the soils used for crops, not only to increase yields, but also to increase the amount of crop residues and the content of organic matter in the soils. All the soils, except soils of the flood plains and soils that have been limed, require lime for the highest yields of most crops. The need for fertilizer and lime varies for each crop and each soil, and, therefore, the kinds and amounts added should be determined by referring to the current recommendations of the Kentucky Agricultural Experiment Station.

Many of the more nearly level soils, unless they are artificially drained, are too wet for good growth of most row crops and are suited only to grasses and legumes that tolerate wetness. Tile drains or open drainage ditches and diversion ditches will reduce wetness. Improving the channel of the stream, where needed, also helps to reduce wetness. These practices will increase yields and allow growing a greater range of crops.

Capability Groups of Soils

The capability classification is a grouping of soils that shows, in a general way, how suitable they are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all the kinds of soil are grouped at three levels, the capability class, subclass, and unit. The eight capability classes in the broadest grouping are designated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes, there can be as many as four subclasses. The subclass is indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil will interfere with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the country, indicates that the chief limitation is a climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c* because the soils in it have little or no susceptibility to erosion but have other limitations that limit their use largely to pasture, range, woodland, or wildlife. Adair County has no soils in class V.

Within the subclasses are the capability units, groups of soils enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally identified by numbers assigned locally, for example, IIe-1 or IIIe-2.

Soils are classified in capability classes, subclasses, and units in accordance with the degree and kind of their permanent limitations; but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soil; and without consideration of possible but unlikely major reclamation projects.

The eight classes in the capability system, and the subclasses and units in this county, are described in the list that follows. The soils were assigned to capability units on a statewide basis. Because not all of the capability units in the State are represented in this county, the numbering of the units may not be consecutive. For example, no soils of capability unit IIe-4 have been recognized in Adair County. Therefore, this capability unit is not discussed in this report.

Class I. Soils that have few limitations that restrict their use.
- (No subclasses.)
  - Unit I-1.—Nearly level, well-drained, neutral or slightly acid, silty or sandy soils of the bottom lands.
  - Unit I-2.—Nearly level, moderately well drained, medium or slightly acid, loamy soil of the bottom lands.
  - Unit I-3.—Nearly level, well-drained, strongly acid, young soil of the stream terraces.

Class II. Soils that have some limitations that reduce the choice of plants or that require moderate conservation practices.
- Subclass IIe. Soils subject to moderate erosion if they are not protected.
  - Unit IIe-1.—Gently sloping, well-drained soils that have a brownish surface layer, a moderately permeable subsoil, and a deep root zone.
  - Unit IIe-2.—Gently sloping, well-drained, medium acid soil that has a brownish surface layer, a red, clayey subsoil, and a deep root zone.
  - Unit IIe-5.—Gently sloping, well drained, strongly acid soil that has a brownish surface layer, a silty subsoil, and a deep root zone.
  - Unit IIe-6.—Gently sloping, moderately well drained, strongly acid soil of the stream terraces; it has a firm, compact pan and a moderately deep root zone.
  - Unit IIe-7.—Gently sloping, moderately well drained, strongly acid soils on the uplands and on foot slopes and stream terraces; they have a firm, compact pan and a moderately deep root zone.
  - Unit IIe-10.—Gently sloping, moderately well drained or well drained, strongly acid soil of the uplands; it has a brownish surface layer, a firm, compact pan, and a moderately deep root zone.
  - Unit IIe-11. Gently sloping, well-drained, medium or strongly acid, cherty soils that have a subsoil that is moderate to moderately rapid in permeability and that provides a deep root zone.
- Subclass IIw. Soils that have moderate limitations because of excess water.
  - Unit IIw-1.—Nearly level, moderately well drained or well drained, young soil of the stream terraces; it has a deep root zone, and permeability is moderately slow in the lower part of the subsoil.
  - Unit IIw-2.—Nearly level, moderately well drained, strongly acid, silty soils that have a firm, compact pan that restricts drainage.
  - Unit IIw-4.—Somewhat poorly drained or moderately well drained, silty, young soils of the flood plains and low stream terraces; high water table.
  - Unit IIw-6.—Nearly level, somewhat poorly drained, gravelly soil of the flood plains; high water table.
- Subclass IIs. Soils that have moderate limitations of moisture capacity and a large amount of gravel that interferes with tillage.
  - Unit IIs-1.—Well-drained, slightly or medium acid, gravelly soils of the flood plains.

Class III. Soils that have severe limitations that reduce the choice of plants, or require special conservation practices, or both.
- Subclass IIIe. Soils subject to severe erosion if they are cultivated and not protected.
  - Unit IIIe-1. Well-drained soils that have a brownish surface layer, a moderately permeable subsoil, and a deep root zone.
  - Unit IIIe-2.—Well-drained, medium or strongly acid soils that have a brownish or yellowish surface layer, a moderately permeable subsoil, and a deep root zone.
  - Unit IIIe-3.—Well-drained, medium or strongly acid soils that have a silty or sandy subsoil and a deep root zone.
  - Unit IIIe-6.—Well-drained, medium or strongly acid soils that are cherty and have a subsoil that is moderate or moderately rapid in permeability; deep or moderately deep root zone.
  - Unit IIIe-9.—Moderately well drained, strongly acid soils that have a silty surface layer and subsoil, a compact pan that restricts drainage, and a shallow to moderately deep root zone.
  - Unit IIIe-10.—Gently sloping, well-drained, strongly acid, silty soil that has a moderately deep root zone.
  - Unit IIIe-13.—Gently sloping, somewhat excessively drained, slightly acid soil that has a shallow root zone.
  - Unit IIIe-14.—Gently sloping, well-drained, strongly acid soils that have a clayey subsoil and a shallow to moderately deep root zone.
  - Unit IIIe-15. Gently sloping, moderately well-drained, strongly acid, cherty soil that has a compact pan that restricts drainage and limits the depth of root penetration.

Subclass IIIw. Soils that have severe limitations because of excess water.

Unit IIIw-1.—Nearly level, somewhat poorly drained, strongly acid soils that have a firm, compact pan that restricts drainage and limits the depth of root penetration.

Unit IIIw-5.—Nearly level, poorly drained, slightly or medium acid soil of the flood plains; restricted drainage.

Unit IIIw-7.—Nearly level, poorly drained, dark-colored, clayey, neutral soil of the flood plains; moderately slow permeability.

Subclass IIIs Soils that have severe limitations of moisture capacity or tilth.

Unit IIIs-1.—Nearly level, excessively drained, strongly acid, sandy soil of the flood plains.

Class IV. Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

Subclass IVe. Soils subject to very severe erosion if they are cultivated and not protected.

Unit IVe-3.—Strongly sloping, well-drained, medium or strongly acid soils that have a silty surface layer, a clayey subsoil, and a moderately deep root zone.

Unit IVe-4.—Strongly sloping, well-drained, strongly acid soils that have a cherty or sandy surface layer, a cherty subsoil, and a moderately deep or deep root zone.

Unit IVe-6.—Moderately well drained to somewhat excessively drained soils that have a shallow to moderately deep root zone.

Unit IVe-8.—Well-drained, strongly acid soils that have a plastic, clayey subsoil and a shallow to moderately deep root zone.

Unit IVe-11.—Well-drained, strongly acid soil that has a surface layer of silty clay loam, a firm, clayey subsoil, and a deep root zone.

Unit IVe-16.—Moderately well drained, strongly acid soils that have a cherty, silty surface layer and a firm, compact pan that restricts drainage and limits the depth to which roots can penetrate.

Subclass IVw. Soils that have very severe limitations for cultivation because of excess water.

Unit IVw-1.—Nearly level, poorly drained, strongly acid soils that have a grayish, silty surface layer and a very firm, very compact pan that restricts drainage and limits the depth to which roots can penetrate.

Subclass IVs. Soils that have very severe limitations of stoniness, low moisture capacity, or other soil features.

Unit IVs-2.—Excessively drained, strongly acid, cherty soil that has moderately rapid permeability and a moderately deep root zone.

Class V. Soils not likely to erode that have other limitations, impractical to remove, that limit their use largely to pasture or range, woodland, or wildlife food and cover. (No soils of class V are recognized in Adair County.)

Class VI. Soils that have severe limitations that make them generally unsuitable for cultivation and that limit their use largely to pasture or range, woodland, or wildlife food and cover.

Subclass VIe. Soils severely limited, chiefly by risk of erosion, if protective cover is not maintained.

Unit VIe-1.—Strongly sloping to moderately steep, well-drained, medium or strongly acid soils.

Unit VIe-2.—Strongly sloping, well-drained, severely eroded, medium or strongly acid soils that have a clayey subsoil and are on the uplands.

Unit VIe-8.—Strongly sloping, moderately well drained to excessively drained soils that have a shallow root zone and low or very low moisture-supplying capacity.

Subclass VIs. Soils generally unsuitable for cultivation and limited for other uses by their moisture capacity, stones, or other features.

Unit VIs-1.—Strongly sloping, well-drained, very rocky, eroded, strongly acid soils of the uplands; they have a firm, clayey subsoil, low moisture-supplying capacity, and a shallow to moderately deep root zone.

Unit VIs-3.—Strongly sloping, excessively drained, cherty, strongly acid soil of the uplands; shallow to moderately deep root zone.

Class VII. Soils that have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife.

Subclass VIIe. Soils very severely limited, chiefly by risk of erosion, if protective cover is not maintained.

Unit VIIe-1.—Well-drained to excessively drained, medium or strongly acid, moderately steep soils that have a moderately deep root zone and moderately low or low moisture-supplying capacity.

Unit VIIe-2.—Well-drained to excessively drained, strongly sloping to steep soils that are shallow over bedrock and are on the uplands.

Unit VIIe-3.—Strongly sloping to very steep, somewhat excessively drained, severely eroded soils that are very shallow over bedrock and are on the uplands.

Unit VIIe-4.—Gullied land that is very severely eroded and consists mostly of an intricate pattern of gullies.

Subclass VIIs. Soils very severely limited by moisture capacity, stones, or other soil features.

Unit VIIs-1.—Moderately steep or steep, somewhat excessively drained or excessively drained, strongly acid soils that have a shallow root zone and moderately low to very low moisture-supplying capacity.

Unit VIIs-2.—Strongly sloping to steep, well-drained, strongly acid, very rocky soils of the uplands; clayey, plastic subsoil; low or very low moisture-supplying capacity, and a shallow root zone.

Unit VIIs-5.—Land where 25 to about 90 percent of the surface area is occupied by rock outcrops that restrict use primarily to woodland or wildlife.

Class VIII. Soils and landforms that have limitations that preclude their use for commercial production of plants and restrict their use to recreation, wildlife, water supply, or esthetic purposes.

Subclass VIIIs. Rock or soil materials that have little potential for production of vegetation.

Unit VIIIs-1.—Land on which rock outcrop, mostly limestone, occupies more than 90 percent of the surface.

Management by capability units

The soils in one capability unit have about the same limitations and similar risks of damage. The soils in one unit, therefore, need about the same kind of management, though they may have formed from different kinds of parent material and in different ways. The capability units are described in the following pages, and management is suggested for the soils of each unit.

CAPABILITY UNIT I-1

This capability unit consists of well-drained, nearly level soils of the bottom lands. The soils are friable and are silty or sandy. They are neutral or slightly acid.

These soils are high in natural fertility and in moisture-supplying capacity. They have moderate to moderately rapid permeability. The soils are medium in content of organic matter, have a deep root zone, and are easy to till. There is no hazard of erosion, but the soils are subject to occasional flooding, which sometimes causes local scouring. The following soils are in this unit:

Huntington fine sandy loam.
Huntington silt loam.
Staser loam.
Staser silt loam.

The soils in this capability unit occupy about 3 percent of the county. About 75 percent of their acreage is cultivated, 20 percent is pastured, and 5 percent is wooded.

These soils are well suited to all of the crops and pasture plants commonly grown in the county, but corn is the chief crop. Under intensive management, the soils can be used to grow row crops year after year. Alfalfa can be grown successfully, but the stand lasts longer on soils of the uplands that are particularly well suited to that crop than on these soils of the bottom lands. These soils are generally not used for tobacco, because of the hazard of occasional flooding.

Lime is not required for most crops grown on these soils, but productive stands of alfalfa and of some other legumes may require moderate applications. Even if fertilizer is not added, good yields are obtained. Phosphate and potash are required for high yields, however, if the soils are farmed intensively. Nitrogen is required for nonlegumes, and boron is required for alfalfa. The need for these plant nutrients ought to be determined with the aid of soil tests.

If these soils are used intensively, good practices are required to maintain the content of organic matter and good tilth. Some practices that are effective include stubble mulching, returning crop residues to the soils, planting winter cover crops, and using minimum tillage.

These soils are generally very favorable for tillage and for seeding and harvesting. Occasionally, floods late in spring delay tillage, and where crops are not harvested early, rains late in fall sometimes interfere with harvesting. Competition from weeds is sometimes a hazard, especially in rainy seasons when cultivation has been delayed.

Special practices to control water are not generally required. Where runoff and overwash from adjacent higher slopes are a hazard, a diversion ditch at the base of the slope will help to protect these soils. Scouring can be prevented along well-defined drainageways by establishing vegetated waterways. In places improving the channel of the stream is effective in reducing overflow.

The soils in this unit are well suited to sprinkler irrigation. Water for irrigation is commonly available for those areas along the large streams.

CAPABILITY UNIT I-2

Only one soil—Lindside silt loam—is in this capability unit. It is a moderately well drained, nearly level soil of the bottom lands. This soil is loamy and friable, and it is medium or slightly acid.

This soil is high in natural fertility and in moisture-supplying capacity. It is moderate in permeabilty and medium in content of organic matter. The root zone is deep, and the soil is easy to till. There is no hazard of erosion, but the soil has a seasonally high water table and is subject to occasional flooding.

Lindside silt loam occupies about 8 percent of the county. About 60 percent is cultivated, 30 percent is in pasture, and 10 percent is wooded.

This soil is well suited to all of the crops and pasture plants commonly grown in the county. Corn is the chief crop, but yields of small grains and soybeans are also good. Under intensive management, this soil can be used year after year to grow row crops. Alfalfa is adapted to this soil and grows especially well in areas that have been drained. The stand lasts longer, however, on soils of the uplands that are particuarly well suited to that crop. This soil is generally not used for tobacco, because of slight wetness and occasional flooding. There is no risk of erosion, but normal good practices are required to maintain good tilth and productivity.

Lime is not required for most crops, but productive stands of alfalfa and of some other legumes may require moderate applications. Even if fertilizer is not added, good yields of most crops are generally obtained. Phosphate and potash are required for high yields, however, if the soil is farmed intensively. Nitrogen is required for nonlegumes, and boron is required for alfalfa. The need for these plant nutrients should be determined with the aid of soil tests.

If this soil is farmed intensively, good practices are required to maintain the content of organic matter and good tilth. Stubble mulching, returning crop residues to the soil, growing winter cover crops, and using minimum tillage are effective practices.

This soil is generally favorable for tillage and for seeding and harvesting. Occasional flooding late in spring delays tillage. If crops are not harvested early, rains late in fall sometimes interfere with harvesting. Tillage is often delayed because of slight wetness. Severe competition from weeds is sometimes a hazard, especially in rainy seasons when cultivation has been delayed.

Special practices to control water are sometimes required on this soil. Tile drainage is not necessary for most crops, although it lengthens the time available for field operations and increases the possibility of obtaining high yields. Runoff and overwash from adjacent higher slopes can be controlled by constructing diversion ditches at the base of the slopes. Scouring along drains can be controlled effectively by establishing perennial grasses. In places drainage ditches help remove excess water, and in some areas improving the channel reduces the risk of overflow and scouring. This soil is well suited to sprinkler irrigation. Water for irrigation is generally available to those areas along the large streams.

CAPABILITY UNIT I-3

Only one soil—Sequatchie silt loam, 0 to 4 percent slopes—is in this capability unit. This is a young soil of the stream terraces. It is nearly level, well drained, friable, and strongly acid. The surface layer is dark-brown silt loam, and the subsoil is strong-brown silty clay loam.

This soil is moderately high in natural fertility, very high in moisture-supplying capacity, and moderately rapid in permeability. It is medium in content of organic matter, has a deep root zone, and is easy to till. There is no hazard of erosion, except on slopes of more than 2 percent. Some areas are subject to occasional flooding.

This soil occupies about 0.2 percent of the county. About 58 percent is cultivated, 36 percent is in pasture, and 6 percent is wooded.

The soil is suited to many different kinds of crops, but corn is the chief crop and is grown year after year in many areas. Soybeans, small grains, red clover, alfalfa, Kobe lespedeza, and Korean lespedeza are adapted hay crops. Pasture plants suitable to grow on this soil include orchardgrass, redtop, ladino clover, and Kentucky 31 fescue.

Lime, potash, and phosphate are required for all crops, and nitrogen is required for nonlegumes. Boron is required to obtain a productive stand of alfalfa. The need for plant nutrients should be determined with the aid of soil tests.

If this soil is farmed intensively, good management is required to maintain the content of organic matter and good tilth. Such practices as stubble mulching, returning crops residues to the soil, using minimum tillage, and occasionally planting a close-growing crop are effective in maintaining and building up productivity.

This soil is generally favorable for tillage and also for seeding and harvesting. It can be tilled over a fairly wide range of moisture content. Occasionally, floods late in spring delay tillage.

Special practices to control water are generally required. The longer slopes should be cultivated on the contour. Runoff and overwash from adjacent higher slopes can be effectively controlled by constructing diversion ditches at the base of the slopes. To prevent gullies from forming along the natural drains, vegetated waterways should be established. This soil is suitable for sprinkler irrigation; generally, water for irrigation is available.

CAPABILITY UNIT IIe-1

This capability unit consists of well-drained, gently sloping, medium acid soils of the uplands and stream terraces. The surface layer of these soils is brownish, friable silt loam, and their subsoil is silty clay loam.

These soils are moderately high to high in natural fertility, very high in moisture-supplying capacity, and moderate in permeability. They are medium in content of organic matter, have a deep root zone, and are easy to till. The hazard of erosion is moderately low. These soils are only slightly eroded, except in a few areas where erosion is moderate. The following soils are in this unit:

Bewleyville silt loam, 2 to 6 percent slopes.
Etowah silt loam, 2 to 6 percent slopes.
Pembroke silt loam, 2 to 6 percent slopes.

These soils occupy about 1 percent of the county. About 55 percent of the acreage is cultivated, 30 percent is in pasture, and 15 percent is wooded.

Under good management, the soils of this unit are suited to all of the crops commonly grown in the county. These crops include corn, small grains, soybeans, tobacco, alfalfa, red clover, and the lespedezas. These are among the best soils in the county for alfalfa and tobacco. Suitable pasture plants are orchardgrass, redtop, Kentucky 31 fescue, and ladino clover.

The hazard of erosion is generally great enough to require that the soils be used for close-growing crops at least 1 year out of 3 and that contour tillage be practiced. On slopes 100 feet long or longer, stripcropping or terraces can also be used to help control erosion; otherwise, close-growing crops should be grown more frequently.

The amount of lime needed on these soils is determined by the kind of crop to be grown. Generally, lime is not required for tobacco, but moderate to heavy applications are often necessary for alfalfa and other legumes. Even if fertilizer is not added, yields are fair, but phosphate and potash are required for high yields. Nitrogen is required for nonlegumes, and boron is required for alfalfa. The need for plant nutrients should be determined with the aid of soil tests.

If these soils are farmed intensively, good management is required to maintain good tilth and the content of organic matter. Such practices as stubble mulching, returning crop residues to the soils, planting winter cover crops, and using minimum tillage are effective in maintaining productivity and in increasing the amount of water that enters the soil.

These soils are generally very favorable for tillage, and also for seeding and harvesting. They can be cultivated over a fairly wide range of moisture content.

If these soils are well managed, water is not difficult to control and the risk of erosion is slight. Cultivating on the contour and stripcropping or using terraces on the longer slopes help protect the soils. Gullying can be prevented along the natural drains by shaping the sides of the drains and by seeding perennial grasses, such as Kentucky 31 fescue. Runoff and overwash from adjacent higher slopes are often a hazard, especially on the Etowah soil. Ditches constructed at the base of the slope to divert the water away from the area and direct it into natural channels also help protect the soils from erosion. These soils are considered suited to sprinkler irrigation, but water for irrigation generally is not available.

CAPABILITY UNIT IIe-2

Only one soil—Christian silt loam, 2 to 6 percent slopes—is in this capability unit. It is a well-drained, gently sloping soil of the uplands and is medium acid. Its surface layer is brownish, friable silt loam or fine sandy loam, and its subsoil is firm, red clay.

This soil is moderate in natural fertility and permeability, very high in moisture-supplying capacity, and medium in content of organic matter. The root zone is deep. The soil is easy to till, and the hazard of erosion is moderately low. This soil is only slightly eroded, except in a few areas where erosion is moderate. In the moderately eroded areas, the present surface layer consists of red, clayey material that was formerly part of the subsoil.

This soil occupies about 0.4 percent of the county. About 50 percent of the acreage is used for cultivated crops, 25 percent is used for pasture, 20 percent is wooded, and the rest is idle.

This soil is well suited to all of the crops and pasture plants commonly grown in the county. These crops include corn, small grains, soybeans, tobacco, alfalfa, red clover, and the lespedezas. Pasture plants suited to this soil include orchardgrass, redtop, Kentucky 31 fescue, and ladino clover.

The hazard of erosion is generally great enough to require that this soil be used for close-growing crops at least 1 year in 3 and that contour tillage be practiced. On slopes 100 feet long or longer, stripcropping or terraces can also be used to help control erosion; otherwise, close-growing crops should be grown more frequently than 1 year in 3.

The amount of lime needed is determined by the kind of crop to be grown. Generally, light applications meet the needs for tobacco and moderate or heavy applications are needed for alfalfa. Phosphate and potash are needed for all crops; nitrogen, for nonlegumes; and boron, for alfalfa. The need for plant nutrients should be determined with the aid of soil tests.

If this soil is farmed intensively, it is very difficult to maintain the content of organic matter unless practices are used to conserve the supply. Stubble mulching, returning crop residues to the soil, planting winter cover crops, using minimum tillage, and growing adequately fertilized, close-growing crops are all good practices.

This soil is generally favorable for tillage and for seeding and harvesting. It can be tilled over a fairly wide range of moisture content.

Runoff is the chief hazard if this soil is cultivated. If good management is used, however, controlling water is not difficult and the risk of erosion is slight. Cultivating on the contour and using stripcropping or terraces on the longer slopes will reduce the risk of erosion and increase the amount of water that enters the soil. Gullying can be prevented along the natural drains by shaping the sides of the drains and by establishing perennial grasses, such as Kentucky 31 fescue. These soils are considered suited to sprinkler irrigation, but water for irrigation is not available in many places.

CAPABILITY UNIT IIe-5

Only Mountview silt loam, 2 to 6 percent slopes, is in this capability unit. It is a well-drained, gently sloping, strongly acid soil of the uplands. The surface layer is brownish, friable silt loam, and the subsoil is yellowish-brown, firm silt loam or silty clay loam.

This soil is moderately low in natural fertility, very high in moisture-supplying capacity, moderately permeable, and medium in content of organic matter. The root zone is deep. The soil is easy to till, and the hazard of erosion is moderately low. Generally, this soil is only slightly eroded. In a few areas, however, erosion is moderate and the present surface layer consists of a mixture of material from the yellowish subsoil and the original surface layer.

This soil occupies about 1 percent of the county. About 40 percent of the acreage is cultivated, 30 percent is in pasture, 25 percent is in woods, and the rest is idle.

This soil is generally suited to corn, tobacco, small grains, soybeans, Kobe lespedeza, Korean lespedeza, and red clover. Under intensive management, alfalfa makes fairly good yields. Pasture plants suitable for this soil include orchardgrass, Kentucky 31 fescue, redtop, and ladino clover.

In most places the hazard of erosion is great enough to require that this soil be used for close-growing crops at least 1 year out of 3 and that contour tillage be practiced. On slopes 100 feet long or longer, stripcropping or terraces can also be used to help control erosion; otherwise, close-growing crops should be grown more frequently in the rotation.

This soil requires lime for most crops. It needs phosphate and potash for all crops, nitrogen for nonlegumes, and boron for alfalfa. The need for these plant nutrients should be determined with the aid of soil tests.

Good tilth and the content of organic matter are difficult to maintain if this soil is used intensively. Stubble mulching, returning crop residues to the soil, planting winter cover crops, using minimum tillage, and growing adequately fertilized, close-growing crops are good practices for maintaining productivity and for reducing erosion.

This soil is generally favorable for tillage and for seeding and harvesting. It can be cultivated over a fairly wide range of moisture content.

Runoff is the chief hazard if this soil is cultivated. If good management is used, water is not difficult to control and the risk of erosion is slight. Cultivating on the contour and using stripcropping or terraces on the longer slopes will reduce the risk of erosion and increase the amount of water that enters the soil. Gullying can be prevented along the natural waterways by shaping the sides of the drains and by establishing a good sod of perennial grasses, such as Kentucky 31 fescue. These soils are considered suitable for sprinkler irrigation, but water for irrigation is generally not available.

CAPABILITY UNIT IIe-6

Only Captina silt loam, 2 to 6 percent slopes, is in this capability unit. It is a moderately well drained, gently sloping soil that is strongly acid and is on stream terraces. The surface layer is grayish-brown, friable silt loam, and the upper part of the subsoil is yellowish-brown, firm silty clay loam. A compact layer, or pan, occurs at a depth of 20 to 36 inches. This pan limits the depth to which roots can penetrate and restricts internal drainage.

This soil is moderate in natural fertility, high in moisture-supplying capacity, and medium in content of organic matter. The root zone is moderately deep. Permeability is moderate in the surface layer and in the upper part of the subsoil and slow in the pan. The soil is easy to till, and the hazard of erosion is moderately low. Generally, the soil is only slightly eroded, but a few areas are moderately eroded. In the moderately eroded areas, the present surface layer consists of a mixture of soil material from the yellowish subsoil and the original surface layer. Because of restricted drainage, the soil is slightly wet.

This soil occupies about 0.5 percent of the county. About 55 percent of the acreage is cultivated, 30 percent is in pasture, 10 percent is in trees, and the rest is idle.

This soil is suited to corn, tobacco, small grains, Korean lespedeza, Kobe lespedeza, red clover, ladino clover, redtop, and Kentucky 31 fescue. It is not well suited to deep-rooted crops or to crops that will not tolerate slight wetness. Under intensive management, fair yields of orchardgrass, alfalfa, and timothy are obtained.

In most places the hazard of erosion is great enough to require that this soil be used for close-growing crops at least 1 year out of 2 and that tillage be done on the contour. On slopes 100 feet long or longer, stripcropping or terraces can also be used to help control erosion.

This strongly acid soil needs lime for nearly all crops. It also needs potash and phosphate for all crops, nitrogen for nonlegumes, and boron for alfalfa. The need for plant nutrients should be determined with the aid of soil tests.

Good tilth, the content of organic matter, and the general productivity of this soil are difficult to maintain under intensive use unless good management practices are used. Stubble mulching, returning crop residues to the soil, planting winter cover crops, and using minimum tillage are all good practices. It is also important to include an adequately fertilized, close-growing crop in the cropping system.

This soil is generally favorable for tillage and for seeding and harvesting. Sometimes, however, it is wet early in the season, and this delays tillage.

Runoff is the chief hazard if this soil is cultivated. If the soil is well managed, water is not difficult to control and the risk of erosion is only slight. Tilling on the contour and stripcropping or constructing terraces on the longer slopes reduce the risk of erosion and increase the amount of water that enters the soil. Gullying can be controlled along the natural drains by establishing a permanent sod of perennial grass. Runoff and overwash from adjacent higher slopes can be controlled effectively by constructing diversion ditches at the base of the slopes. This soil is considered suitable for sprinkler irrigation, and water for irrigation is available in some places.

CAPABILITY UNIT IIe-7

This capability unit consists of moderately well drained, gently sloping, strongly acid soils on stream terraces and on foot slopes and uplands. The soils have a surface layer of grayish-brown, friable silt loam. The upper part of their subsoil is yellowish-brown silt loam or silty clay loam. A firm, compact layer, or pan, is at a depth of 20 to 30 inches. This pan restricts internal drainage and limits the depth to which roots can penetrate.

These soils are moderately low in natural fertility, moderately high in moisture-supplying capacity, and medium to low in content of organic matter. They have a moderately deep root zone. Permeability is moderate in the surface layer and in the upper part of the subsoil and slow in the pan. The hazard of erosion is moderately low, and the soils are easy to till. They are somewhat droughty. The following soils are in this unit:

Landisburg silt loam, 2 to 6 percent slopes.
Sango silt loam, 2 to 6 percent slopes.

These soils occupy about 5 percent of the county. About 30 percent of the acreage is cultivated, 35 percent is used for pasture, 25 percent is used for trees, and 10 percent is idle.

The soils of this unit are generally best suited to shallow-rooted crops and to crops that tolerate moderate drainage. Suitable crops include corn, tobacco, small grains, Kobe lespedeza, Korean lespedeza, red clover, ladino clover, redtop, and Kentucky 31 fescue. Under intensive management, yields of orchardgrass and alfalfa are fair, but the stand often does not last long. Tobacco requires particularly intensive management for high yields.

In most places the hazard of erosion is great enough to require that these soils be used for close-growing crops at least 1 year out of 2 and that they be cultivated on the contour. On slopes 100 feet long or longer, stripcropping or terraces can also be used to help protect the soils from erosion.

These soils require lime for all crops. They are generally low in fertility and require large amounts of fertilizer for good yields. Phosphate and potash are required for all crops; nitrogen, for nonlegumes; and boron, for alfalfa. The need for plant nutrients should be determined with the aid of soil tests.

Many areas of these soils are low in content of organic matter and in fertility. Therefore, good practices are required to build up and maintain the content of organic matter, to improve tilth, and to increase the general productivity. Stubble mulching, returning crop residues to the soils, planting winter cover crops, and using minimum tillage are all good practices. It is also important to include adequately fertilized, close-growing crops in the cropping system.

These soils are generally favorable for tillage and for seeding and harvesting. They are slightly slow to dry out early in the growing season, however, and tillage is thus delayed.

Runoff is the chief hazard if these soils are cultivated. If the soils are well managed, water is not difficult to control and the risk of erosion is slight. Tilling on the contour, using stripcropping or terraces on the longer slopes, and keeping tillage to a minimum are practices that reduce the risk of erosion and increase the amount of water that enters the soils. Gullying can be prevented along the natural drains by establishing permanent grassed waterways. In most places runoff and overwash are hazards on the Landisburg soil, but they can be controlled by constructing diversion ditches at the base of the higher adjacent slopes. Small wet or seepy spots generally can be improved by tiling. These soils are fairly well suited to sprinkler irrigation.

CAPABILITY UNIT IIe-10

Only one soil—Dickson silt loam, 2 to 6 percent slopes—is in this capability unit. It is a moderately well drained

or well drained, strongly acid, gently sloping soil of the uplands. The surface layer is brown, friable silt loam, and the upper part of the subsoil is yellowish-brown silty clay loam. A firm, compact layer, or pan, is at a depth of about 26 inches. This pan restricts internal drainage and limits the depth to which roots can penetrate.

This soil is moderate in natural fertility, high in moisture-supplying capacity, and medium in content of organic matter. It has a moderately deep root zone. Permeability is moderate in the surface layer and in the upper part of the subsoil, and it is slow in the pan. This soil is easy to till, and the hazard of erosion is moderately low.

This soil occupies about 1 percent of the county. About 40 percent of the acreage is cultivated, 35 percent is in pasture, 20 percent is wooded, and the rest is idle.

This soil is generally best suited to shallow-rooted crops and to crops that tolerate only moderately good drainage. Suitable plants include corn, tobacco, small grains, Korean lespedeza, Kobe lespedeza, red clover, ladino clover, redtop, and Kentucky 31 fescue. Under intensive management alfalfa and orchardgrass are fairly well suited.

The hazard of erosion is generally great enough to require that this soil be used for close-growing crops at least 1 year out of 2 and that contour tillage be practiced. On slopes 100 feet long or longer, stripcropping or terraces can also be used to help control erosion.

This soil requires lime for all crops, and it also needs large amounts of fertilizer for good yields. The soil needs phosphate and potash for all crops, nitrogen for nonlegumes, and boron for alfalfa. The need for plant nutrients should be determined with the aid of soil tests.

Good practices are required to maintain the content of organic matter, to improve tilth, and to increase the general productivity of this soil. Stubble mulching, returning crop residues to the soil, planting winter cover crops, and using minimum tillage are all good practices. Including an adequately fertilized, close-growing crop in the cropping system is also important.

This soil is generally favorable for tillage and for seeding and harvesting. It can be tilled over a fairly wide range of moisture content.

Runoff is the chief problem if this soil is cultivated. If the soil is well managed, water is not difficult to control and the risk of erosion is slight. Tilling on the contour, stripcropping or constructing terraces on the longer slopes, and using minimum tillage reduce erosion and increase the amount of water that enters the soil. Gullying can be prevented along the natural drains by establishing permanent grassed waterways. This soil is suited to sprinkler irrigation, but water for irrigation is not available in many places.

CAPABILITY UNIT IIe-11

This capability unit consists of well-drained, medium or strongly acid, gently sloping soils of the uplands and stream terraces. The soils have a surface layer of friable cherty silt loam and a subsoil of cherty silty clay loam to clay.

These soils are moderate to moderately low in natural fertility, moderately high to high in moisture-supplying capacity, and moderate to moderately rapid in permeability. They are medium to low in content of organic matter. Their root zone is deep. The hazard of erosion is moderately low. The soils are slightly droughty, and chert and gravel in the surface layer interfere somewhat with tillage. The following soils are in this unit:

- Baxter cherty silt loam, 2 to 6 percent slopes.
- Frankstown cherty silt loam, 2 to 6 percent slopes.
- Humphreys cherty silt loam, 2 to 6 percent slopes.

These soils occupy about 1 percent of the county. About 35 percent of the acreage is cultivated, 40 percent is in pasture, 23 percent is wooded, and the rest is idle.

These soils are slightly droughty because of their content of chert, and they are best suited to crops that tolerate drought. Suitable plants include corn, tobacco, small grains, Korean lespedeza, sweetclover, and Kentucky 31 fescue. Under intensive management, some other crops are suitable, such as orchardgrass, ladino clover, and red clover. Generally, the soils are not well suited to alfalfa, redtop, and smooth bromegrass.

The hazard of erosion is generally great enough to require that these soils be used for close-growing crops at least 1 year out of 3 and that contour tillage be practiced. On slopes 100 feet long or longer, stripcropping or terraces can also be used to help protect the soils from erosion.

These soils require lime for most crops. They require phosphate and potash for all crops, and nitrogen for nonlegumes. The need for plant nutrients should be determined with the aid of soil tests.

If these soils are used intensively, their content of organic matter is difficult to maintain. Good practices are required if productivity is to be built up and maintained. Stubble mulching, returning crop residues to the soils, growing winter cover crops, and using minimum tillage and similar practices are effective. It is also important to include an adequately fertilized, close-growing crop in the cropping system.

These soils can be tilled over a fairly wide range of moisture content. Their content of chert, however, makes tillage somewhat difficult.

Runoff is a major problem if these soils are cultivated. If the soils are well managed, water is not difficult to control and the risk of erosion is slight. Tilling on the contour, stripcropping or using terraces on the longer slopes, and using minimum tillage reduce erosion and increase the amount of water that enters the soil. Gullying can be controlled along the natural drains by establishing permanent sod waterways. Runoff and overflow are often hazards on the Humphreys soil, but diversion ditches, constructed at the base of the adjacent high slopes, generally provide effective control. These soils are suitable for sprinkler irrigation, but water for irrigation is not available in many places.

CAPABILITY UNIT IIw-1

The only soil in this capability unit is Wolftever silt loam. It is a moderately well drained or well drained, strongly acid, nearly level, young soil of the stream terraces. The soil has a surface layer of grayish-brown, friable silt loam and a subsoil of brown, firm, compact silty clay loam.

This soil is moderate in natural fertility, very high in moisture-supplying capacity, and medium in content of organic matter. It has a deep root zone. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Because it occurs in low

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areas, this soil may be slightly wet and is somewhat slow to dry out and warm up at the beginning of the growing season. It is subject to occasional flooding.

This soil occupies about 0.2 percent of the county. About 60 percent is cultivated, 30 percent is pastured, and 10 percent is wooded.

This soil is probably best suited to plants that tolerate slight wetness. Suitable plants are corn, soybeans, small grains, Korean lespedeza, Kobe lespedeza, red clover, redtop, Kentucky 31 fescue, and alsike clover. Under intensive management, other suitable plants are alfalfa and orchardgrass, but the stand generally does not last long. The soil is not used for tobacco if better drained soils are available.

If properly managed, this soil can be used year after year for row crops without the loss of its fertility and good tilth. The supply of organic matter, the good tilth, and the fertility are difficult to maintain, however, unless close-growing crops are grown at least 1 year out of 3.

This strongly acid soil requires lime for most crops. It also requires phosphate and potash for high yields of all crops, and nitrogen for nonlegumes. The need for plant nutrients should be determined with the aid of soil tests.

The supply of organic matter and the good tilth are fairly easy to maintain if good management is used. Returning crop residues to the soil, planting winter cover crops, and using minimum tillage are all good practices. It is also important to include an adequately fertilized, close-growing crop in the cropping system.

Tilling and seeding are often delayed in spring because this soil is slightly wet. This soil can be tilled, however, over a fairly wide range of moisture content.

Excess water is the chief hazard in using this soil. In some nearly level areas, open drainage ditches help remove excess surface water. Runoff and overwash from adjacent higher slopes can be controlled by constructing diversion ditches at the base of the slopes. Tile drainage is not required for the production of crops.

CAPABILITY UNIT IIw-2

This capability unit consists of moderately well drained, strongly acid, nearly level, silty soils of the uplands and stream terraces. The soils have a surface layer of grayish-brown, friable silt loam. The upper part of their subsoil is yellowish-brown, firm silt loam or silty clay loam. A firm, compact pan that restricts drainage and limits the depth to which roots can penetrate is at a depth of 20 to 30 inches. The Landisburg cherty silt loam has chert throughout the profile, and it is therefore somewhat difficult to till.

These soils are moderately low in natural fertility, moderately high in moisture-supplying capacity, and low in content of organic matter. Their root zone is moderately deep. Permeability is moderate in the upper part of the soil and slow in the pan. There is no hazard of erosion, but the soils are somewhat wet late in winter and early in spring, and they are droughty in midsummer. The following soils are in this unit:

Landisburg cherty silt loam, 0 to 2 percent slopes.
Landisburg silt loam, 0 to 2 percent slopes.
Sango silt loam, 0 to 2 percent slopes.

These soils occupy about 0.6 percent of the county. About 25 percent of the acreage is cultivated, 40 percent is pastured, 25 percent is wooded, and 10 percent is idle.

These soils are generally best suited to shallow-rooted crops and to crops that tolerate alternate wet and dry periods. The most suitable plants are corn, soybeans, small grains, alsike clover, red clover, ladino clover, Kobe and Korean lespedezas, redtop, and Kentucky 31 fescue. Timothy and orchardgrass can be grown if they are heavily fertilized and if other good practices are used. The soils are not used to grow tobacco or alfalfa if better drained, more fertile soils are available.

Because of their low fertility and low content of organic matter, these soils should not be used for row crops more than 3 years out of 4. Even if they are so used, their productivity cannot be built up and maintained unless good management is used.

These soils require heavy applications of lime, phosphate, and potash for all crops. Split applications are generally more economical and produce higher yields than a single application. Nitrogen is required for nonlegumes. The need for plant nutrients should be determined with the aid of soil tests.

The content of organic matter is difficult to maintain. If the soils are used intensively, stubble mulching, returning crop residues to the soils, planting winter cover crops, and using minimum tillage are all good practices. It is also important to include an adequately fertilized, close-growing crop in the cropping system.

These soils are wet during the early part of the growing season. As a result, tillage and seeding are delayed in many places. The cherty soil is somewhat difficult to till, but the soils that are free of chert can be tilled easily.

Excess water is the chief hazard if the soils are cultivated. The soils are not considered suitable for tile drainage. Practices that improve drainage are constructing open drainage ditches and running the rows up and down the slopes. Runoff and overwash from adjacent high slopes are often hazards on the Landisburg soils. Diversion ditches, constructed at the base of the slopes, generally provide adequate control.

Permanent sod should be established in the natural drainageways to control scouring and to permit more efficient use of machinery. These soils are somewhat less well suited to irrigation than the better drained and more productive soils.

CAPABILITY UNIT IIw-4

This capability unit consists of somewhat poorly drained or moderately well drained, silty, young soils that are in slight depressions or in nearly level areas. The soils are on flood plains and on low stream terraces. They have a surface layer of brownish silt loam and a subsoil of brownish silt loam to silty clay loam. The soils are somewhat wet because of a periodically high water table, and they are subject to occasional flooding.

These soils are moderate in natural fertility, very high in moisture-supplying capacity, and medium in content of organic matter. They are moderate in permeability and are slightly acid to strongly acid. The soils have a deep root zone and are easy to till. They are not subject to erosion, but floods may cause local scouring. The following soils are in this unit:

Newark silt loam.
Whitwell silt loam.

These soils occupy about 1 percent of the county. About 55 percent of the acreage is cultivated, 40 percent is pastured, and 5 percent is wooded.

These soils are generally best suited to plants that tolerate a large amount of moisture. These include corn, small grains, soybeans, alsike clover, red clover, Kobe lespedeza, Korean lespedeza, redtop, timothy, and Kentucky 31 fescue. After the soils have been drained, orchardgrass and smooth bromegrass are also suitable. Tobacco generally is not grown because the soils are too wet and are flooded occasionally. Alfalfa can be grown after the soils are drained, but the stand does not last long.

After these soils are drained, they can be used for row crops year after year. There is no risk of erosion, but the proper kinds and amounts of fertilizer are required to maintain and increase the productivity.

The requirements for lime are somewhat variable. The Whitwell soil requires lime for all crops, and light to moderate applications of lime generally increase the productivity of the Newark soil. Phosphate and potash are required for all crops, and nitrogen is required for nonlegumes. The need for these plant nutrients should be determined with the aid of soil tests.

The content of organic matter and the general productivity of these soils is fairly easy to maintain under intensive cropping if good management is used. Returning crop residues to the soils, planting winter cover crops, and using minimum tillage are all good practices. It is also important to include an adequately fertilized, close-growing crop in the cropping system from time to time.

These soils are easy to till, and they can be cultivated over a fairly wide range in moisture content. They are often wet early in the growing season, and as a result, tillage is delayed. Delayed tillage and severe competition from weeds occasionally reduce yields or cause crop failure.

Excess water is the chief hazard if these soils are cultivated. The soils are suitable for tile drainage, and drainage ditches help remove excess water quickly. Runoff and overwash from adjacent high slopes can be controlled effectively by constructing diversion ditches at the base of the slopes. Whether or not drainage is feasible depends upon whether suitable outlets are available. After the soils are drained, they are suitable for sprinkler irrigation. Water for irrigation is available in most places.

CAPABILITY UNIT IIw-6

Newark gravelly silt loam is the only soil in this capability unit. It is a somewhat poorly drained, nearly level, medium acid, gravelly soil of the flood plains. Its surface layer is grayish-brown gravelly silt loam, and its subsoil is grayish-brown, mottled gravelly silt loam. The soil is somewhat wet because of the water table, which is periodically high, and it is subject to occasional flooding.

This soil is moderate in natural fertility, moderately high in moisture-supplying capacity, and medium in content of organic matter. It has moderate to moderately rapid permeability. The root zone is moderately deep or deep. The large amount of gravel in the surface layer makes tillage somewhat difficult. The soil is somewhat droughty in midsummer.

This soil occupies about 0.8 percent of the county. Approximately 30 percent of the acreage is in cultivated crops, 40 percent is in pasture, and 30 percent is in trees.

This soil is best suited to crops that tolerate wetness and to crops that can withstand drought. Suitable plants are corn, small grains, soybeans, alsike clover, ladino clover, Korean lespedeza, Kobe lespedeza, Kentucky 31 fescue, and redtop. The soil is not well suited to alfalfa and tobacco, but yields of most crops are fair.

It is somewhat difficult to keep this soil highly productive. If good yields are to be obtained, it needs to be kept in a close-growing crop at least 2 years out of 4. Including close-growing crops frequently in the cropping system, returning crop residues to the soil, and growing winter cover crops help increase productivity.

This soil does not need lime for most crops, although moderate applications may increase yields in some areas. Phosphate and potash are required for all crops, and nitrogen is required for nonlegumes. Applying fertilizer in split applications is sometimes an effective way of increasing yields. The need for plant nutrients should be determined with the aid of soil tests.

Excess water is the chief hazard if this soil is cultivated. Tile drainage is effective in removing excess water, and in some places open drainage ditches are effective. Runoff and overwash from adjacent higher slopes can be controlled by constructing drainage ditches at the base of the slopes. After the soil is drained, it is somewhat droughty, yields are not high, and the number of crops that can be grown is somewhat limited.

CAPABILITY UNIT IIs-1

This capability unit consists of well-drained, nearly level, slightly or medium acid, gravelly soils of the flood plains. The soils have a surface layer of grayish-brown gravelly loam and a subsoil of brown or dark grayish-brown gravelly loam.

These soils have a high rate of infiltration and moderately rapid permeability. They are moderate in natural fertility, moderately high in moisture-supplying capacity, and medium in content of organic matter. The root zone is deep. There is no hazard of erosion, but the soils are subject to occasional flooding. The large amount of gravel in the surface layer makes tillage somewhat difficult, and floods late in spring sometimes delay tillage. The soils are slightly droughty. The following soils are in this unit:

Huntington gravelly loam.
Staser gravelly loam.

These soils occupy about 2 percent of the county. About 60 percent of the acreage is in cultivated crops, 35 percent is in pasture, and 5 percent is in trees.

These soils are suited to corn, small grains, soybeans, Korean lespedeza, red clover, alsike clover, redtop, and Kentucky 31 fescue. They are not well suited to alfalfa, sweetclover, Kobe lespedeza, timothy, and orchardgrass, except under intensive management. Tobacco is generally not grown, because of the occasional flooding and because the soils are slightly droughty.

If these soils are used intensively, the supply of plant nutrients must be kept high if high yields are to be obtained. Generally, close-growing crops should be grown at least 1 year out of 3.

Lime is not required for good yields of most crops on these soils. If the soils are used intensively, however, and if high yields of clover and other legumes are to be expected, moderate applications of lime are sometimes re-

quired. Yields are fair without adding phosphate and potash, but if the soils are farmed intensively, phosphate and potash are required for sustained high yields. Nitrogen is required for nonlegumes. Using fertilizer in split applications is sometimes an economical and effective way of increasing yields. The need for these plant nutrients should be determined with the aid of soil tests.

These soils are loose and porous, and a high content of organic matter is somewhat difficult to build up and maintain. Returning crop residues to the soils, growing winter cover crops, and using minimum tillage are all good practices. It is also important to include an adequately fertilized, close-growing crop frequently in the cropping system.

Control of water is not difficult on these soils. Runoff and overflow from adjacent high slopes can be controlled by constructing diversion ditches at the base of the slopes. In some areas, improving the channel will be an effective way of reducing the amount of overflow. Perennial grasses should be established in the natural drains to control scouring. These soils are suitable for sprinkler irrigation.

CAPABILITY UNIT IIIe-1

This capability unit consists of well-drained, medium acid, sloping soils of the uplands and stream terraces. The soils have a surface layer of brown, friable silt loam and a subsoil of brownish or reddish, firm silty clay loam to silty clay. Erosion is only slight in most areas. Some areas are moderately eroded, however, and the present surface layer consists of material that was formerly part of the subsoil.

These soils are moderately high to high in natural fertility and very high in moisture-supplying capacity. They are moderately permeable, have a deep root zone, and are medium in content of organic matter. The soils are easy to till. The hazard of erosion is moderate. The following soils are in this unit:

Bewleyville silt loam, 6 to 12 percent slopes.
Bewleyville silt loam, 6 to 12 percent slopes, eroded.
Etowah silt loam, 6 to 12 percent slopes.
Pembroke silt loam, 6 to 12 percent slopes.

These soils occupy about 0.9 percent of the county. About 55 percent of the acreage is cultivated, 20 percent is pastured, and 15 percent is wooded.

The soils of this unit are suited to corn, tobacco, small grains, soybeans, alfalfa, Kobe lespedeza, Korean lespedeza, sericea lespedeza, red clover, ladino clover, alsike clover, smooth bromegrass, orchardgrass, Kentucky 31 fescue, redtop, and timothy. They are among the best soils in the county for alfalfa and tobacco. When the soils are properly managed, good to excellent yields of all the crops commonly grown in the county are obtained.

In most places the hazard of erosion is great enough to require that the soils be used for close-growing crops at least 2 years out of 3 and that contour tillage be practiced. On slopes 90 feet long or longer, terraces or stripcropping can also be used to help control erosion.

Phosphate and potash are required for high yields of all crops and permanent pastures, and nitrogen is required for nonlegumes. For alfalfa and similar crops, lime is required to make the soils slightly acid or neutral. Moderate applications generally increase the yields of other crops if these soils are used intensively. Boron is required for alfalfa. The need for plant nutrients should be determined with the aid of soil tests.

A good supply of organic matter is not difficult to maintain in these soils if suitable cropping practices are used. Practices effective in maintaining good tilth, productivity, and the content of organic matter consist of returning crop residues to the soils, planting winter cover crops, and using minimum tillage. It is also important to include, frequently, an adequately fertilized, close-growing crop in the cropping system. In the few moderately eroded areas particularly good management is required to build up the content of organic matter and to increase productivity.

No special problems are encountered in tilling and in seeding and harvesting crops on these soils. When in good tilth, these soils can be tilled over a fairly wide range of moisture content.

The hazard of erosion is the chief limiting factor if these soils are cultivated. Growing adequately fertilized, close-growing crops, tilling on the contour, using terraces or stripcropping, and establishing vegetated waterways are all practices effective in controlling erosion and in increasing the amount of water that enters the soils. Runoff and overwash from adjacent higher slopes, often a hazard on the Etowah soil, can be controlled by constructing diversion ditches at the base of the slopes. The soils of this unit are well suited to irrigation, but water for irrigation is seldom available and the hazard of erosion is such that high-value crops cannot be grown more than 1 year out of 3.

CAPABILITY UNIT IIIe-2

This capability unit consists of well-drained, medium or strongly acid, sloping soils of the uplands and foot slopes. The soils have a surface layer of dark grayish brown or yellowish brown. The Christian and Cookeville soils have a red, clayey subsoil, and the Humphreys soil has a strong-brown, firm silty clay loam subsoil. These soils have been slightly to moderately eroded. In the eroded areas the surface layer consists of a mixture of soil material from the original surface layer and the subsoil. In places the present surface layer consists of red, clayey material that was formerly part of the subsoil.

These soils are moderate to moderately high in natural fertility and are very high in moisture-supplying capacity. They are moderately permeable. The content of organic matter is medium to low, and the soils have a deep root zone. They are easy to till except in areas where the surface layer is red, clayey material that was formerly part of the subsoil. The following soils are in this unit:

Christian silt loam, 6 to 12 percent slopes.
Christian silt loam, 6 to 12 percent slopes, eroded.
Cookeville silt loam, 6 to 12 percent slopes, eroded.
Humphreys silt loam, 6 to 12 percent slopes.

These soils occupy nearly 4 percent of the county. About 45 percent of the acreage is cultivated, 30 percent is pastured, 20 percent is wooded, and the rest is idle.

The soils of this unit are suited to corn, tobacco, small grains, red clover, ladino clover, Korean lespedeza, sericea lespedeza, redtop, and Kentucky 31 fescue. Under intensive management they are also suited to smooth bromegrass, orchardgrass, timothy, and alfalfa.

In most areas the hazard of erosion is great enough to require that these soils be used for close-growing crops at least 3 years out of 4 and that contour tillage be practiced.

On slopes 30 feet long or longer, terraces or stripcropping can also be used to help control erosion.

Phosphate and potash are required for good yields of all crops and permanent pastures on these soils, and nitrogen is required for good yields of nonlegumes. A moderate amount of lime benefits most crops. For alfalfa, enough lime should be applied to keep the reaction near neutral, and boron is also required. The need for plant nutrients should be determined with the aid of soil tests.

These soils are productive if they are managed so that the content of organic matter is held at a fairly high level. Returning crop residues to the soils, planting winter cover crops, and using minimum tillage are all effective practices. It is also important to include an adequately fertilized, close-growing crop frequently in the cropping system. Mulching is often beneficial for establishing vegetation on the clayey spots and for improving tilth.

There are no special problems in tilling and in seeding and harvesting crops on these soils, except in those areas that have been moderately to severely eroded. Where the surface layer is red, clayey material that was formerly part of the subsoil, tillage is limited to a somewhat narrow range of moisture content and a good stand is sometimes difficult to obtain.

Runoff is the chief problem if these soils are cultivated. The use of adequately fertilized, close-growing crops, contour tillage, terraces, vegetated waterways, and stripcropping is effective in holding soil losses to a minimum and in increasing the amount of water that enters the soil. Runoff and overwash are often hazards on the Humphreys soil. Ditches, constructed at the base of adjacent higher slopes to divert water into natural drains, are effective in helping protect the soil from erosion. The soils of this unit are considered suitable for sprinkler irrigation. The hazard of erosion is great enough, however, that the production of high-value row crops is somewhat limited.

CAPABILITY UNIT IIIe-3

This capability unit consists of well-drained, medium or strongly acid, sloping soils of the uplands. In areas that are not eroded, the surface layer is friable silt loam or fine sandy loam. In areas that are eroded, yellow or red soil material that was formerly part of the subsoil and that is low in organic matter has been mixed into the surface layer. The subsoil is firm silt loam to sandy clay.

These soils are moderately low in natural fertility, moderate to moderately rapid in permeability, medium to low in content of organic matter, and moderately high to very high in moisture-supplying capacity. Their root zone is deep. The hazard of erosion is moderate on the uneroded areas and moderately severe on the eroded areas. The following soils are in this unit:

Christian fine sandy loam, 6 to 12 percent slopes, eroded.
Mountview silt loam, 6 to 12 percent slopes.
Mountview silt loam, 6 to 12 percent slopes, eroded.

These soils occupy about 3 percent of the county. About 25 percent of the acreage is in cultivated crops, 35 percent is in pasture, 30 percent is in trees, and the rest is idle.

These soils are slightly droughty, and the range of suitable plants is somewhat limited. Under good management corn, tobacco, small grains, red clover, Korean lespedeza, sericea lespedeza, Kentucky 31 fescue, orchardgrass, alfalfa, ladino clover, timothy, and Kobe lespedeza are suitable plants.

In most areas the hazard of erosion is great enough to require that the soils be used for close-growing crops at least 2 years out of 3 and that contour tillage be practiced. On slopes 90 feet long or longer, terraces or stripcropping can be used to help control erosion.

Lime is generally required for all crops grown on these soils, but the Mountview soils require somewhat heavier applications than the Christian soil. Phosphate and potash are required for all crops, and nitrogen is required for nonlegumes. A high level of fertility is somewhat difficult to maintain on these soils. Split applications of fertilizer are sometimes effective in increasing yields. Alfalfa requires enough lime to bring the reaction up to near neutral, and it also requires boron. The need for plant nutrients should be determined with the aid of soil tests.

Crop yields on these soils generally can be increased by adding fairly heavy applications of fertilizer and by using practices that maintain the content of organic matter. Such practices as returning crop residues to the soils, planting winter cover crops, and using minimum tillage are effective in maintaining the content of organic matter.

No special problems are encountered in tilling, seeding, and harvesting crops on these soils. If hay and pasture plants are adequately fertilized, a stand is fairly easy to obtain.

Runoff is the chief hazard if these soils are cultivated. Cultivating on the contour, constructing terraces, stripcropping, establishing vegetated waterways, growing winter cover crops, and using minimum tillage are all practices that are effective in helping control erosion and in increasing the amount of water that enters the soils. It is also important to include an adequately fertilized, close-growing crop frequently in the cropping system. The soils of this unit are fairly well suited to sprinkler irrigation, but their use for high-value row crops is somewhat limited.

CAPABILITY UNIT IIIe-6

This capability unit consists of well-drained, medium or strongly acid, sloping soils of the uplands and stream terraces. The soils have a surface layer of cherty silt loam and a cherty subsoil.

These soils are moderate to moderately low in natural fertility, moderate to moderately rapid in permeability, and low in content of organic matter. Their root zone is moderately deep or deep. The soils are slightly to moderately eroded; they are subject to severe erosion if clean-cultivated crops are grown. The fragments of chert interfere with tillage and tend to accelerate the movement of water through the profile. The soils are somewhat droughty. The following soils are in this unit:

Baxter cherty silt loam, 6 to 12 percent slopes.
Baxter cherty silt loam, 6 to 12 percent slopes, eroded.
Christian-Baxter cherty loams, 6 to 12 percent slopes, eroded.
Frankstown cherty silt loam, 6 to 12 percent slopes.
Frankstown cherty silt loam, 6 to 12 percent slopes, eroded.
Humphreys cherty silt loam, 6 to 12 percent slopes.
Humphreys cherty silt loam, 6 to 12 percent slopes, eroded.

These soils occupy about 10 percent of the county. About 25 percent of the acreage is cultivated, 35 percent is in pasture, 30 percent is wooded, and 10 percent is idle.

These soils are moderately well suited to most of the commonly grown row crops, grasses, and legumes. Plants that resist drought and that mature early are the most

suitable. Corn, tobacco, small grains, Korean lespedeza, Kobe lespedeza, Kentucky 31 fescue, and ladino clover are suitable crops, but yields of these crops are generally lower than on the more nearly level soils that are high in moisture-supplying capacity.

The hazard of erosion is generally great enough to require that these soils be used for close-growing crops at least 2 years out of 3 and that contour tillage be practiced. On slopes 30 feet long or longer, stripcropping or terraces can also be used to help protect the soils.

Lime is required for all crops grown on these soils. Heavy applications of phosphate and potash are required for all crops, and nitrogen is required for nonlegumes. The need for these plant nutrients should be determined with the aid of soil tests.

The content of organic matter is difficult to maintain unless good management practices are followed. Returning crop residues to the soils, growing winter cover crops, and using minimum tillage are suitable practices for increasing the content of organic matter. It is also important to include an adequately fertilized, close-growing crop frequently in the cropping system.

Runoff is a major problem if these soils are cultivated. Using contour tillage, terraces or stripcropping, and minimum tillage are effective in controlling runoff.

The content of chert in these soils makes tillage difficult. Many of the slopes are irregular, and in many places it is difficult to till the soils on the contour. There are depressions and occasional sinkholes in some areas. In areas that are not eroded, the soils can be tilled over a fairly wide range of moisture content. In eroded areas the range is more limited, especially on the Baxter and Christian soils, which have a more clayey surface layer than the other soils. Where the surface layer is red, clayey material that was formerly part of the subsoil, a stand of grass is generally difficult to establish.

If these soils are well managed, they can be used for row crops with only a moderate risk of erosion. Contour tillage and the use of stripcropping or terraces on the longer slopes reduce the risk of erosion and increase the amount of water that enters the soil. Gullying can be controlled along the natural drains by establishing a permanent sod of perennial grasses. Runoff and overwash are often hazards on the Humphreys soils. Diversion ditches, constructed at the base of the adjacent higher slopes, provide effective control in many areas. These soils are fairly well suited to sprinkler irrigation, but their use for high-value row crops is somewhat limited.

CAPABILITY UNIT IIIe-9

This capability unit consists of moderately well drained, strongly acid, sloping soils of the terraces and foot slopes. The soils have a surface layer of brownish, friable silt loam. Their subsoil is silty, and the upper part is yellowish brown and firm. A pan that restricts internal drainage and the depth to which roots can penetrate is at a depth of about 2 feet. The eroded soil has a more yellowish surface layer than the uneroded soil, and it is shallower over the pan.

These soils are low in natural fertility and in content of organic matter, and they have a shallow to moderately deep root zone. Permeability is moderate in the upper part of the subsoil and slow in the pan. The soils are fairly easy to till, but the hazard of erosion is moderately severe. The following soils are in this unit:

Landisburg silt loam, 6 to 12 percent slopes.
Landisburg silt loam, 6 to 12 percent slopes, eroded.

The soils of this unit occupy about 0.4 percent of the county. About 30 percent of the acreage is cultivated, 25 percent is pastured, 35 percent is wooded, and the rest is idle.

The soils of this unit are generally best suited to shallow-rooted crops and to crops that are adapted to alternate wet and dry conditions. Suitable crops are corn, small grains, tobacco, Kobe lespedeza, Korean lespedeza, red clover, ladino clover, redtop, and Kentucky 31 fescue. Yields of most adapted crops are only fair.

The hazard of erosion is generally great enough that close-growing crops should be grown at least 3 years out of 4 and that contour tillage should be practiced. On slopes 85 feet long or longer, the use of stripcropping or terraces can also be used to help control erosion.

These strongly acid soils require lime. They require phosphate and potash for all crops and nitrogen for nonlegumes. The need for these plant nutrients should be determined with the aid of soil tests.

A high content of organic matter is difficult to build up and maintain in these soils, even under intensive management. Growing winter cover crops, returning crop residues to the soil, and using minimum tillage all help build up and maintain the supply of organic matter. They also help to maintain good tilth and favorable structure and to protect the soils from erosion.

These soils are somewhat slow to warm up, and they do not dry out until late in spring. As a result, tillage is often slightly delayed. In many places seepage spots interfere with tillage, but the soils generally can be tilled over a fairly wide range of moisture content.

Runoff is the chief problem if these soils are cultivated. If the soils are properly managed, the risk of erosion can be minimized and row crops can be grown. Tilling on the contour, using terraces or stripcropping, growing close-growing crops, keeping tillage to a minimum, and providing vegetated waterways are effective measures for controlling runoff. Runoff and overwash from adjacent higher slopes can be controlled by constructing diversion ditches at the base of the slopes. Tiling is often effective in drying up seepy spots. The low productivity of these soils and their limited use for row crops limit their suitability for irrigation.

CAPABILITY UNIT IIIe-10

Mountview silt loam, shallow, 2 to 6 percent slopes, is the only soil in this capability unit. It is a gently sloping, well-drained, strongly acid, silty soil of the uplands. The soil has a surface layer of friable silt loam and a silty subsoil. In many places bedrock is at a depth of about 20 inches.

This soil is moderately low in natural fertility, medium in content of organic matter, and moderately high in moisture-supplying capacity. It has moderate permeability. The root zone is moderately deep. The soil is easy to till, and the hazard of erosion is moderate. Because it is shallow over bedrock, this soil is somewhat droughty.

This soil occupies about 0.3 percent of the county. About 20 percent of the acreage is in cultivated crops,

40 percent is in pasture, 25 percent is in trees, and 15 percent is idle.

This soil is generally best suited to crops and pasture plants that have shallow roots and that are resistant to drought. It is moderately well suited to corn, tobacco, small grains, Korean lespedeza, sericea lespedeza, and Kentucky 31 fescue.

The hazard of erosion is generally great enough to require that this soil be used for close-growing crops at least 2 years out of 3 and that contour tillage be practiced. On slopes 100 feet long or longer, stripcropping or terraces can also be used to help protect the soil from erosion.

This soil is strongly acid and requires lime. Phosphate and potash are required for all crops, and nitrogen is required for nonlegumes. Applying fertilizer in split applications is generally economical and is effective in increasing crop yields. The need for these plant nutrients should be determined with the aid of soil tests.

Maintaining a high content of organic matter in this soil is an effective way to improve the tilth, to increase the moisture-holding capacity, and to improve productivity. Returning crop residues to the soil, growing winter cover crops, using minimum tillage, and including adequately fertilized, close-growing crops frequently in the cropping system are effective practices. This soil is generally favorable for tilling, seeding, and harvesting. Runoff is the chief hazard if the soil is cultivated. Little erosion can be tolerated if the soil is to retain its value for crop production. Tilling on the contour, using stripcropping or terraces, providing vegetated waterways, including close-growing crops in the cropping system, and keeping tillage to a minimum are practices that are effective in holding erosion losses to a minimum and in increasing the amount of water that enters the soil. In places bedrock is so near the surface that it interferes with the construction of terraces. This soil is not desirable for irrigation, because high-value crops cannot be grown frequently.

CAPABILITY UNIT IIIe-13

Only one soil—Westmoreland shaly silt loam, 2 to 6 percent slopes—is in this capability unit. It is a somewhat excessively drained, gently sloping, slightly acid soil of the uplands. Its surface layer is grayish-brown, friable shaly silt loam, and it has a subsoil of yellowish-brown, firm shaly silty clay loam. Weathered, shaly bedrock is at a depth of 10 to 20 inches.

This soil is moderately low in natural fertility and in moisture-supplying capacity. It is moderate in permeability and medium in content of organic matter. The root zone is shallow, and the large amount of shale interferes with tillage. This soil is only slightly eroded, and the hazard of water erosion is moderately low. Erosion must be held to a minimum, however, if the soil is to retain its value for crops.

This soil occupies about 0.3 percent of the county. About 15 percent of the acreage is cultivated, 30 percent is in pasture, 40 percent is wooded, and 15 percent is idle.

This soil is best suited to crops that mature early in the growing season or to crops that resist drought. Yields of corn, tobacco, and small grains are low to fair. Other suitable plants are red clover, sweetclover, Korean lespedeza, and Kentucky 31 fescue.

The hazard of erosion is generally great enough that contour tillage should be practiced, and this soil needs to be used for close-growing crops at least 2 years out of 3. On slopes 100 feet long or longer, stripcropping or terraces can also be used to help protect the soil from erosion.

This soil does not require lime for most crops, but phosphate and potash are required for all crops and nitrogen is required for nonlegumes. Applying fertilizer in split applications is generally economical, and it is an effective way of increasing crop yields. The need for these plant nutrients should be determined with the aid of soil tests.

This soil is droughty, and the content of organic matter is difficult to maintain if the soil is cultivated. Such practices as returning crop residues to the soil, growing winter cover crops, keeping tillage to a minimum, and growing a close-growing crop frequently are effective in maintaining the supply of organic matter and in increasing the moisture-holding capacity. No special problems are encountered in tilling, seeding, and harvesting, except that the shale in the surface layer interferes with tillage in some areas.

Runoff is the chief problem if this soil is cultivated. Little erosion can be tolerated if the soil is to retain its value for crop production. Tilling on the contour, stripcropping or constructing terraces, providing vegetated waterways, growing close-growing crops, and keeping tillage to a minimum are effective practices for controlling erosion and increasing the amount of water that enters the soil. In many places terraces are not practical, because the bedrock is too close to the surface. This soil is not desirable for irrigation, because high-value crops cannot be grown frequently.

CAPABILITY UNIT IIIe-14

This capability unit consists of well-drained, strongly acid, gently sloping soils of the uplands. In uneroded areas the surface layer is dark-brown, friable silt loam and the subsoil is strong-brown, firm clay. In areas that are eroded, the surface layer is lower in content of organic matter than in the uneroded areas, and in places the present surface layer is clayey material that was formerly part of the subsoil. Bedrock is generally at a depth of 20 to 30 inches.

These soils are moderately low in natural fertility and in moisture-supplying capacity. They have a shallow to moderately deep root zone and moderately slow permeability, and they are low in content of organic matter. The hazard of erosion is moderate. The soils are fairly easy to till, except where the surface layer is clayey. The following soils are in this unit:

Needmore silt loam, 2 to 6 percent slopes.
Needmore silty clay loam, 2 to 6 percent slopes, eroded.

These soils occupy about 0.2 percent of the county. About 20 percent of the acreage is cultivated, 30 percent is in pasture, 40 percent is wooded, and the rest is idle.

These soils are suited to Korean lespedeza, sericea lespedeza, and Kentucky 31 fescue. Yields of corn, small grains, and tobacco are low to fair. Alfalfa, red clover, timothy, and orchardgrass have been grown fairly successfully where the soils have been well managed.

In most places the hazard of erosion is great enough to require that these soils be used for close-growing crops at

least 2 years out of 3 and that contour tillage be practiced. On slopes 100 feet long or longer, terraces or stripcropping can also be used to help control erosion.

Lime, phosphate, and potash are required for all crops, and nitrogen is required for nonlegumes. Boron is required for alfalfa. The need for these plant nutrients should be determined with the aid of soil tests.

The productivity of these soils can be increased by using practices to build up the content of organic matter and to increase the moisture-holding capacity. Such practices consist of returning crop residues to the soils, growing winter cover crops, and using minimum tillage. It is also important to include a close-growing crop frequently in the cropping system.

Where these soils are eroded, tillage is somewhat difficult and can be done only within a narrow range of moisture content. A good stand of grasses and legumes is often difficult to obtain where the surface layer is clayey.

Runoff is the chief problem if these soils are cultivated. Little erosion can be tolerated if the soils are to retain their value for crop production. Tilling on the contour, using stripcropping or terraces, providing vegetated waterways, growing close-growing crops, and keeping tillage to a minimum are effective practices for controlling erosion and increasing the amount of water that enters the soils. These soils are not desirable for irrigation, because high-value crops cannot be grown frequently.

CAPABILITY UNIT IIIe-15

Only one soil—Landisburg cherty silt loam, 2 to 6 percent slopes—is in this capability unit. This soil is moderately well drained and strongly acid. It is gently sloping and is on stream terraces and foot slopes. The surface layer is brown, friable cherty silt loam, and the upper part of the subsoil is yellowish-brown, firm cherty silty clay loam. A pan that restricts internal drainage and limits the depth to which roots can penetrate is at a depth of 20 to 30 inches.

This soil is moderately low in natural fertility and in moisture-supplying capacity. It is medium in content of organic matter, and it has a moderately deep root zone. Permeability is moderate in the upper part of the subsoil and slow in the pan. The large amount of chert makes tillage somewhat difficult and limits the moisture-holding capacity of this soil. The soil is somewhat droughty.

This soil occupies about 0.7 percent of the county. About 25 percent of the acreage is cultivated, 35 percent is in pasture, 25 percent is wooded, and the rest is idle.

This soil is suited to Kobe lespedeza, Korean lespedeza, sericea lespedeza, ladino clover, alsike clover, redtop, and Kentucky 31 fescue. It is not well suited to alfalfa, orchardgrass, bromegrass, and red clover. Yields of corn, soybeans, small grains, and tobacco are low to fair.

The hazard of erosion is generally great enough to require that the soil be used for close-growing crops at least 2 years out of 3, and that contour tillage be practiced. On slopes 100 feet long or longer, stripcropping or terraces can also be used to help control erosion. This soil responds only fairly well to management. Economical yields are not likely unless close-growing crops are grown frequently.

Lime, phosphate, and potash are required for all crops, and nitrogen is required for nonlegumes. Applying fertilizer in split applications is often effective in increasing crop yields. The need for plant nutrients should be determined with the aid of soil tests.

Good management is required on this soil to maintain the supply of organic matter and to maintain good tilth and productivity. Such practices as returning crop residues to the soil, growing winter cover crops, and keeping tillage to a minimum are effective. It is also important that the cropping system frequently include an adequately fertilized, close-growing crop.

This soil is slow to dry out, warms up late in spring, and is droughty in midsummer. Tillage is often delayed because the soil is wet. In many places the large amount of chert and the seepage spots interfere with the use of farm equipment.

Runoff is the chief problem if this soil is cultivated. If practices are used to protect the soil, erosion losses can be held to a minimum. Tilling on the contour, using terraces or stripcropping, and providing vegetated waterways are effective in minimizing soil losses and in increasing the amount of water that enters the soil. In many places runoff and overwash from adjacent higher slopes can be eliminated by constructing diversion ditches at the base of the slopes. Seepage spots can sometimes be controlled by tiling. This soil is not very desirable for irrigation, although irrigation will increase the yields of crops.

CAPABILITY UNIT IIIw-1

This capability unit consists of somewhat poorly drained, strongly acid, nearly level soils of the uplands and stream terraces. The surface layer of these soils is friable silt loam, and the upper part of the subsoil is firm, mottled silt loam or silty clay loam. A pan, which restricts drainage and limits the depth to which roots can penetrate, is at an average depth of about 15 inches.

These soils are moderately low in natural fertility, moderately high in moisture-supplying capacity, and low in content of organic matter. Their root zone is moderately deep. Permeability is moderate above the pan and slow in the pan. The soils are wet in winter but are droughty in midsummer. The following soils are in this unit:

Lawrence silt loam.
Taft silt loam.

These soils occupy about 3 percent of the county. About 20 percent of the acreage is cultivated, 40 percent is pastured, 30 percent is wooded, and the rest is idle.

The soils of this unit have a somewhat narrow range of suitability for crops. They are probably best suited to hay and pasture. They are not used for tobacco if other better drained soils are available, and yields of corn, small grains, and soybeans are low to fair. Hay and pasture plants that are suitable are alsike clover, ladino clover, Kobe lespedeza, Korean lespedeza, redtop, and Kentucky 31 fescue. The soils are not well suited to alfalfa, sweetclover, timothy or orchardgrass.

Excess water is the chief hazard if these soils are cultivated. Even after the soils are drained, they have somewhat poor tilth and are low in content of organic matter. An adequately fertilized, close-growing crop should be grown at least 1 year in 2 if the productivity is to be maintained. Returning crop residues to the soils, growing winter cover crops, and using minimum tillage are good practices for increasing the amount of organic matter.

Lime, phosphate, and potash are required for all crops, and nitrogen is required for nonlegumes. The need for plant nutrients should be determined with the aid of soil tests.

Tilling, seeding, and harvesting are limited on these soils because of excess moisture. The soils can be tilled, however, over a fairly wide range of moisture content.

These soils are not generally suitable for tile drainage, because the pan is so near the surface. Providing open drainage ditches and running rows up and down the slope help remove surface water. Runoff and overwash are hazards in many areas of the Taft soil. The soils can generally be protected by constructing diversion ditches at the base of the slope. These soils are not generally desirable for irrigation.

CAPABILITY UNIT IIIw-5

The only soil in this capability unit is Melvin silt loam. It is a poorly drained, slightly or medium acid soil of the flood plains. Its surface layer is grayish-brown, mottled, friable silt loam, and its subsoil is olive-gray, mottled silt loam to silty clay loam. The soil is in nearly level areas or in slight depressions. It is subject to occasional flooding and ponding in places, and it is wet much of the time.

This soil is moderately low in natural fertility and low in content of organic matter. It has moderate permeability. The moisture-supplying capacity is very high, and the root zone is deep.

This soil occupies about 0.2 percent of the county. About 5 percent of the acreage is cultivated, 65 percent is in pasture, 5 percent is in trees, and 25 percent is idle.

This soil is generally too wet for tilled crops and most hay crops. It is probably best suited to alsike clover, ladino clover, Kentucky 31 fescue, redtop, and similar crops. Well-managed stands of these plants make good summer pasture. When this soil is properly drained, fairly good yields of corn, soybeans, Kobe lespedeza, and Korean lespedeza are obtained. The soil is not well suited to tobacco, red clover, orchardgrass, or timothy. If the soil is drained and managed intensively, it can be used for row crops year after year.

Lime is not required for most crops grown on this soil. Phosphate and potash are required for all crops, and nitrogen is required for nonlegumes. The need for these plant nutrients should be determined with the aid of soil tests.

Even after this soil is drained, good practices are required to maintain its supply of organic matter. If it is farmed intensively, returning crop residues to the soil, growing winter cover crops and close-growing crops, and using minimum tillage are practices that should be used to maintain the productivity.

This soil tends to be wet early in spring, and, as a result, tillage and seeding are delayed until late in spring. Rains during the growing season often delay cultivation, result in severe competition from weeds, and cause occasional crop failures. Rains in fall are likely to make harvesting difficult.

Artificial drainage improves this soil for crops and pasture. Good practices are providing open ditches, tiling, and improving the channel where needed. The feasibility of drainage depends on finding suitable outlets. Diversion ditches at the base of the adjacent higher slopes can be used to control runoff and overwash. Because of wetness and the narrow range of suitable crops, these soils are not desirable for irrigation.

CAPABILITY UNIT IIIw-7

Dunning silt loam is the only soil in this capability unit. It is a poorly drained, neutral soil of the flood plains. The surface layer is dark grayish-brown, firm, heavy silt loam, and the subsoil is black, firm silty clay loam. The soil is in nearly level areas or in slight depressions.

This soil is high in natural fertility and in content of organic matter. It is also high in moisture-supplying capacity and has moderately slow permeability. The root zone is moderately deep or deep. The soil is subject to occasional flooding and is wet most of the time.

This soil occupies about 0.1 percent of the county. About 5 percent of the acreage is cultivated, 70 percent is in pasture, 5 percent is wooded, and 20 percent is idle.

If this soil has not been drained, it is generally too wet for tilled crops. It has been used for corn and soybeans, but crops often fail because of the high water table and competition from weeds. The soil is suited to such pasture plants as alsike clover, ladino clover, redtop, and Kentucky 31 fescue, which produce good summer pasture. After the soil has been drained, it is suited to a fairly wide range of hay and pasture crops, and high yields of corn, small grains, and soybeans are obtained. This soil is not well suited to tobacco.

Lime is not required on this soil. The soil is high in fertility, but phosphate and potash are required to maintain good yields if the soil is farmed intensively. Nitrogen is required for nonlegumes. The need for these plant nutrients should be determined with the aid of soil tests.

The large amount of organic matter is fairly easy to maintain if crop residues are returned to the soil, if cover crops are grown and turned under, and if close-growing crops are grown occasionally.

Because of wetness, crops on this soil have a short growing season unless the soil is drained. The soil is often plowed when wet. As a result, it is likely to be somewhat cloddy, and a good seedbed is therefore difficult to prepare. Tillage is limited to a somewhat narrow range of moisture content because of the content of clay. Delayed tillage because of wetness and severe competition from weeds sometimes result in reduced crop yields, even after the soil has been drained.

Artificial drainage improves this soil for crops and pasture. Good practices consist of providing open ditches, tiling, and improving the channel where needed. The feasibility of draining the soil depends on finding suitable outlets. Because of the fine texture of the subsoil, the tile may have to be spaced closer together than normal. Diversion ditches at the base of adjacent higher slopes can be used to control runoff and overwash from the slopes. This soil can be irrigated after it is drained.

CAPABILITY UNIT IIIs-1

Only one soil—Bruno loamy fine sand—is in this capability unit. It is an excessively drained, nearly level, strongly acid, sandy soil of the flood plains. Both the surface layer and the subsoil are dark grayish-brown, loose loamy fine sand. Stratified sandy and gravelly alluvium is at a depth of about 2½ feet. The soil is subject to occasional flooding.

This soil is moderately low in natural fertility and in moisture-supplying capacity, and it is low in content of organic matter. The root zone is deep. The soil is rapidly

permeable, has a high rate of infiltration, and is droughty.

Only about 55 acres of this soil is in the county. Nearly all of the acreage has been cleared, and about half of it is cultivated. The rest is in pasture.

Yields of corn, small grains, and Korean lespedeza are low to fair. The soil is probably best suited to pasture plants that resist drought, such as Kentucky 31 fescue. It is not suited to orchardgrass, alfalfa, or red clover. Tobacco is seldom grown because the soil is not considered suited to that crop.

The content of organic matter is low in this soil, and it is difficult to build up and maintain. Yields of adapted crops can be increased by growing a close-growing crop frequently, by returning crop residues to the soil, and by growing winter cover crops.

This soil is somewhat difficult to till with heavy equipment because it is loose. It can be tilled, however, over a wide range of moisture content.

Flooding and scouring present a problem in places, but water control is not generally a problem. In places improving the channel and establishing vegetated waterways are effective measures for reducing overflow and scouring. The soil is not well suited to sprinkler irrigation.

CAPABILITY UNIT IVe–3

This capability unit consists of well-drained, medium or strongly acid, strongly sloping soils of the uplands. In areas that are not eroded, the surface layer is brownish, friable silt loam, cherty silt loam, or cherty loam; the subsoil in such areas is red and clayey and is cherty in many places. In the eroded areas, part of the red, clayey subsoil is mixed into the surface layer and the soils are lighter colored and lower in content of organic matter than the soils that are not eroded. In places all of the present surface layer consists of material that was formerly part of the subsoil.

These soils have moderately high or very high moisture-supplying capacity and moderate natural fertility and permeability. They are medium to low in content of organic matter and have a moderately deep root zone. The rate of infiltration is somewhat slow because of the large amount of clay in the subsoil. The strong slopes, rate of runoff, and content of chert cause these soils to be somewhat droughty. The following soils are in this unit:

Baxter cherty silt loam, 12 to 20 percent slopes.
Baxter cherty silt loam, 12 to 20 percent slopes, eroded.
Christian silt loam, 12 to 20 percent slopes.
Christian silt loam, 12 to 20 percent slopes, eroded.
Christian-Baxter cherty loams, 12 to 20 percent slopes, eroded.

These soils occupy about 5 percent of the county. About 25 percent of the acreage is cultivated, 45 percent is in pasture, 25 percent is in trees, and the rest is idle.

The use of these soils is limited by their strong slope, erosion and the hazard of further erosion, droughtiness, and the content of chert. The soils are suited to most of the commonly grown pasture plants, including alfalfa, red clover, sweetclover, the lespedezas, ladino clover, orchardgrass, and Kentucky 31 fescue. Yields of corn, small grains, soybeans, and tobacco are generally fair, but they are slightly higher in the areas that are not eroded. The soils are probably best used for hay and pasture.

The hazard of further erosion is generally great enough to require that the soils be used for close-growing crops at least 4 years in 5. If the soils are cultivated, intensive management is required to help control erosion.

The amount of lime needed varies somewhat, but generally moderate to heavy applications are required. Phosphate and potash are required for all crops, and nitrogen is required for nonlegumes. Boron is required for alfalfa. The need for plant nutrients should be determined with the aid of soil tests.

The supply of organic matter is not difficult to maintain if these soils are used for pasture and are adequately fertilized. It is very difficult to maintain if the soils are used often for row crops and if erosion is not controlled. If the soils are to be used to grow lespedeza or other annual legumes, a cover crop should be grown in winter to protect them from erosion and leaching.

The strong slopes, which are irregular in places, the amount of chert in the soils, and erosion make these soils somewhat difficult to till. Cultivating row crops is more difficult than preparing the seedbed. A good stand is often difficult to obtain in the more eroded areas, especially where the surface layer is red, clayey material from the former subsoil. A mulch of straw or manure on the eroded areas is often beneficial. Moisture conditions are generally more favorable for seeding in spring than at other times.

The hazard of erosion is moderately severe if these soils are cultivated. If row crops are to be grown, all machine operations should be on the contour and slopes longer than about 50 feet ought to be stripcropped. Slopes that exceed 275 feet should not be used for row crops. Terraces on these strong slopes are not practical. Runoff is a very severe hazard along the natural drains. Close-growing perennial grasses, such as Kentucky 31 fescue and bermudagrass, ought to be established in all these waterways. These soils are not suitable for irrigation.

CAPABILITY UNIT IVe–4

This capability unit consists of well-drained, strongly acid, cherty or sandy soils. The soils are strongly sloping and are on the uplands. In areas that are not eroded, these soils have a cherty or sandy surface layer and a subsoil of yellowish-brown cherty silty clay loam or red clay. In the eroded areas the surface layer consists of a mixture of material from the original surface layer and the subsoil. The eroded soils are lower in content of organic matter than the uneroded soils, and they are less productive of the commonly grown crops.

These soils have moderately high to moderately low moisture-supplying capacity and moderately rapid permeability. They are low in content of organic matter. Their root zone is moderately deep or deep. The rate of infiltration is fairly high, but the moisture-holding capacity is somewhat limited because of the content of sand or chert. The soils are droughty, especially in midsummer. The following soils are in this unit:

Christian fine sandy loam, 12 to 20 percent slopes, eroded.
Frankstown cherty silt loam, 12 to 20 percent slopes.
Frankstown cherty silt loam, 12 to 20 percent slopes, eroded.
Humphreys cherty silt loam, 12 to 20 percent slopes, eroded.

These soils occupy about 4 percent of the county. The Frankstown soils make up most of the acreage. About 10 percent of the acreage is cultivated, 40 percent is in pasture, 30 percent is wooded, and 20 percent is idle.

These soils were once commonly used to grow cultivated crops, but yields of corn and tobacco were low and crop failures were common. They are gradually being aban-

doned for that use. The soils are probably best suited to hay and pasture plants, such as Korean lespedeza and Kentucky 31 fescue. Yields of red clover, ladino clover, redtop, orchardgrass, and bermudagrass are fairly good if the soils are adequately fertilized and are properly managed. These soils are not well suited to alfalfa and smooth bromegrass. Because yields are low and a good stand is difficult to obtain, small grains seeded in fall are seldom grown on these droughty soils. Good stands of grasses and legumes are more likely to be obtained when these plants are seeded in spring than when they are seeded in fall.

The use of these soils is limited by their strong slopes, erosion, and hazard of further erosion, droughtiness, and content of chert. The soils are better suited to hay and pasture than to cultivated crops. The hazard of erosion is great enough to require that the soils be used for close-growing crops at least 4 years in 5. If the soils are cultivated, intensive management is required to help control erosion.

Lime, phosphate, and potash are required for all crops, and nitrogen is required for nonlegumes. Light, frequent applications of fertilizer are often more effective for pastures than occasional, heavy applications. The need for these plant nutrients should be determined with the aid of soil tests.

The supply of organic matter is difficult to maintain, even if these soils are used continuously for hay and pasture. Applying the proper kinds and amounts of fertilizer to a good, thick, vigorous stand of grasses and legumes that are not overgrazed is effective in improving the productivity of the soils.

The strong slopes within some areas are irregular, and the content of chert makes these soils somewhat difficult to till. Cultivating row crops is often more difficult than preparing the seedbed. A good stand is often difficult to obtain on the eroded soils, and adding extra nitrogen and mulching with straw or manure are helpful practices. Moisture conditions are often more favorable for seeding in spring than for seeding at other times.

The hazard of erosion is moderately severe if these soils are cultivated. If they are to be used for row crops, all machine operations should be on the contour and slopes longer than about 50 feet ought to be stripcropped. Slopes longer than 275 feet should not be used for row crops. Terraces are not practical on these soils. Erosion is a very severe hazard along the natural drains. Close-growing perennial grasses, such as Kentucky 31 fescue and bermudagrass, should be established in all these waterways. These soils are not generally suitable for irrigation.

CAPABILITY UNIT IVe-6

This capability unit consists of moderately well drained to somewhat excessively drained, sloping soils of the uplands. The soils have a silty surface layer and a silty, but slightly more clayey and comparatively thin, subsoil. In many places bedrock is at a depth of 12 to 20 inches. The Westmoreland soil is nearly neutral, and the Mountview soils are strongly acid.

These soils have low to moderate moisture-supplying capacity and moderate to moderately rapid permeability. They are medium to low in content of organic matter. The soils are moderately low in natural fertility, and their root zone is shallow to moderately deep. These soils have low moisture-holding capacity, and they are droughty. The hazard of erosion is moderate to severe. The content of shale in the Westmoreland soil makes it somewhat difficult to work. The following soils are in this unit:

Mountview silt loam, shallow, 6 to 12 percent slopes.
Mountview silt loam, shallow, 6 to 12 percent slopes, eroded.
Westmoreland shaly silt loam, 6 to 12 percent slopes.

The soils of this unit occupy about 4 percent of the county. About 10 percent of the acreage is cultivated, 40 percent is in pasture, 30 percent is wooded, and 20 percent is idle.

Yields of corn, small grains, and tobacco are low on these soils. The soils are gradually being abandoned for row crops, and they are probably best suited to hay and pasture. Because these soils are shallow and droughty, the number of suitable pasture plants is limited. Korean lespedeza, sericea lespedeza, Kentucky 31 fescue, and bermudagrass are probably the most suitable. If the soils are adequately fertilized and well managed, other grasses and legumes, such as orchardgrass, redtop, red clover, ladino clover, and sweetclover, can be grown fairly successfully. If more suitable soils are not available, these soils are sometimes used for tobacco. Yields are low to fair, even when a cover crop is turned under as green manure and heavy applications of fertilizer are used. Very low yields can be expected if these intensive practices are not used.

The hazard of erosion is generally great enough to require that these soils be used for close-growing crops at least 4 years in 5. If the soils are cultivated, intensive management is required to help control erosion.

Lime is generally not required on the Westmoreland soil, but heavy additions of lime are necessary on the Mountview soils. Phosphate and potash are required for all crops, and nitrogen is required for nonlegumes. Lighter, more frequent applications of fertilizer are often more effective than heavier, less frequent applications. The need for these plant nutrients should be determined with the aid of soil tests.

The supply of organic matter is difficult to maintain, even if these soils are used for hay and pasture year after year. The proper kinds and amounts of fertilizer added to a good, thick, vigorous stand of grasses and legumes that are not overgrazed is helpful in making these soils more productive.

Tillage is fairly easy, except on the Westmoreland soil, where the shale makes it somewhat difficult. Tillage over a fairly wide range of moisture content is possible. Preparing the seedbed for fall seeding of grasses and legumes is often delayed because the soils are extremely dry. Spring tillage and seeding are often preferred because the supply of moisture in spring is more favorable for tillage and for seed germination and the growth of plants than at other times.

Erosion is the chief hazard if these soils are cultivated. If the soils are to be used for row crops, all machine operations ought to be on the contour. Slopes longer than 90 feet should be stripcropped. In most places it is not feasible to construct terraces, because bedrock is so near the surface. Erosion is a very severe hazard along the natural drains. Close-growing perennial grasses, such as Kentucky 31 fescue and bermudagrass, should be established in all these waterways. If the soils are cultivated, the

waterways should be left in sod. These soils are not generally suited to irrigation.

CAPABILITY UNIT IVe-8

This capability unit consists of well-drained, strongly acid, sloping soils of the uplands. In areas that are not eroded, the soils have a surface layer of dark-brown or dark yellowish-brown, friable silt loam and a firm, clayey, plastic subsoil. In eroded areas the surface layer consists of a mixture of soil material from the original surface layer and the subsoil. The eroded soils are lighter or more yellowish in color, lower in content of organic matter, and generally more clayey than the uneroded soils.

The soils of this unit are low to moderately high in moisture-supplying capacity, moderate to low in natural fertility, and low in content of organic matter. Permeability is moderately slow because of the texture, structure, and plasticity of the subsoil. The root zone is shallow to moderately deep because of the texture and tightness of the subsoil and the depth to bedrock of the Needmore soils. The soils are droughty, especially in midsummer. Infiltration is somewhat slow and runoff is moderately high. The following soils are in this unit:

Needmore silt loam, 6 to 12 percent slopes.
Needmore silty clay loam, 6 to 12 percent slopes, eroded.
Talbott silt loam, 6 to 12 percent slopes, eroded.

The soils of this unit occupy about 1 percent of the county. About 25 percent of the acreage is cultivated, 35 percent is in pasture, 30 percent is in trees, and the rest is idle.

The use of these soils is limited because of the hazard of erosion, droughtiness, and low productivity. The soils are best suited to crops that mature early or to hay and pasture plants that resist drought. The range of suitable pasture plants is somewhat limited. Sericea lespedeza, Korean lespedeza, bermudagrass, and Kentucky 31 fescue are the most suitable plants. Orchardgrass, red clover, and sweetclover can be grown fairly successfully if good management practices are used, but the stand tends to be short lived. The soils have been used for alfalfa, but the stand generally does not last long. Yields of corn, small grains, soybeans, and tobacco are low to fair.

In most places the hazard of erosion is great enough to require that the soils be used for close-growing crops at least 4 years in 5. If the soils are cultivated, intensive management is required to help control erosion.

Lime, phosphate, and potash are needed for all crops, and nitrogen is required for nonlegumes. The need for these plant nutrients should be determined with the aid of soil tests.

The supply of organic matter is difficult to maintain even if the soils are used for hay and pasture. The proper kinds and amounts of fertilizer added to a good stand of grasses and legumes help to increase the productivity of the soils. Overgrazing should be avoided. After an annual legume such as Korean lespedeza has been grown for hay, a winter cover crop should be planted to protect the soils from erosion and to minimize the loss of fertilizer by leaching.

Where these soils are eroded, tillage is somewhat unfavorable because of the clayey surface layer. Tillage is limited to a fairly narrow range of moisture content. Often, the soils cannot be tilled early in fall, because they are extremely dry. A good stand of fall-seeded grasses and legumes is often difficult to obtain because of the lack of moisture in the soils and the difficulty in preparing a good seedbed.

The hazard of erosion is moderately severe if these soils are cultivated. If the soils are to be used for row crops, all machine operations ought to be on the contour. Slopes longer than about 85 feet require stripcropping. In many places terraces are not practical on the Needmore soils, because bedrock is close to the surface.

Erosion is a very severe hazard along the natural drains. Close-growing perennial grasses, such as Kentucky 31 fescue and bermudagrass, should be established in all of these waterways. If the soils are cultivated, the waterways should be left in sod. These soils are not desirable for irrigation.

CAPABILITY UNIT IVe-11

Only one soil—Christian silty clay loam, 6 to 12 percent slopes, severely eroded—is in this capability unit. This is a well-drained, strongly acid, sloping soil of the uplands. In some places its surface layer is yellowish or reddish silty clay loam, but in most places it is red, firm, clayey material that was formerly part of the subsoil.

This soil is moderately low in natural fertility, high in moisture-supplying capacity, and very low in content of organic matter. The root zone is deep. The rate of infiltration is somewhat slow, but permeability is moderate. This soil is somewhat difficult to work because of the large amount of clay in the surface layer. It is somewhat droughty, especially in midsummer.

This soil occupies about 0.6 percent of the county. About 10 percent of the acreage is cultivated, 45 percent is in pasture, 10 percent is wooded, and 35 percent is idle.

The use of this soil is limited because of the strong slope, severe erosion, and droughtiness. Low to fair yields of corn, tobacco, and small grains are obtained. The soil was used intensively for crops until it was severely eroded. After the soil was eroded, it became somewhat difficult to till and yields were low. Now, because much of the acreage is inaccessible and low in productivity, most of it has been abandoned and is idle and reverting to trees. This soil is probably best suited to hay and pasture. Suitable plants include Korean lespedeza, sericea lespedeza, Kentucky 31 fescue, and bermudagrass. If the soil is properly managed, sweetclover, red clover, ladino clover, timothy, and orchardgrass are sometimes fairly successful, but the stand likely will not last long.

The hazard of erosion is great enough to require that close-growing crops be grown at least 4 years in 5. If this soil is cultivated, intensive management is required to help control erosion.

Lime, phosphate, and potash are required for all crops, and nitrogen is required for nonlegumes. The need for these plant nutrients should be determined with the aid of soil tests.

The supply of organic matter is difficult to maintain, even if this soil is used for hay or pasture. The proper kinds and amounts of fertilizer added to a good stand of grasses and legumes help increase the supply of organic matter. Overgrazing ought to be avoided. A winter cover crop should be seeded in annual legume hay crops, such as Korean lespedeza. The cover crop will protect

the soil from erosion, minimize the leaching of plant nutrients, and increase the amount of water that enters the soil.

This soil is somewhat difficult to till because of the large amount of clay in its surface layer. Tillage is limited to a narrow range of moisture content, and it is often not feasible to till the soil early in fall, because it is extremely dry. A stand of fall-seeded grasses and legumes is often difficult to obtain because of the lack of moisture and the difficulty in preparing a good seedbed. Mulching with straw or manure is often helpful in establishing a good cover on the more clayey areas.

The hazard of erosion is moderately severe if this soil is cultivated. If it is to be used for row crops, all machine operations ought to be on the contour. Slopes longer than about 80 feet should be stripcropped. In most places terraces are not very practical on this soil, because of the clayey texture and limited suitability for row crops. Erosion is a very severe hazard along the natural drains. Close-growing perennial grasses, such as Kentucky 31 fescue and bermudagrass, should be established in all of these waterways. If this soil is cultivated, the waterways should be left in sod.. This soil is not very desirable for irrigation.

CAPABILITY UNIT IVe–16

This capability unit consists of moderately well drained, strongly acid, sloping soils of stream terraces and foot slopes. The soils have a surface layer of brown or light yellowish-brown cherty silt loam. The upper part of their subsoil is yellowish-brown cherty silty clay loam. A firm, compact layer, or pan, which restricts drainage and limits the depth to which roots can penetrate, is at a depth of about 24 inches.

These soils are moderately low to low in natural fertility and in moisture-supplying capacity, and they are medium to low in content of organic matter. Their root zone is shallow to moderately deep. Permeability is moderate in the surface layer and in the upper part of the subsoil, and it is slow in the pan. The soils are somewhat difficult to work because of the large amount of chert. In many places these soils contain seepy spots. They are somewhat slow to warm up and dry out early in the growing season, but they are droughty in midsummer.

The following soils are in this unit:

Landisburg cherty silt loam, 6 to 12 percent slopes.
Landisburg cherty silt loam, 6 to 12 percent slopes, eroded.

The soils of this unit occupy about 0.6 percent of the county. About 20 percent of the acreage is cultivated, 40 percent is in pasture, 20 percent is wooded, and the rest is idle.

Because they are droughty and low in productivity, these soils are probably best suited to hay and pasture. Suitable plants include Kobe lespedeza, Korean lespedeza, sericea lespedeza, ladino clover, alsike clover, redtop, and Kentucky 31 fescue. These soils are not well suited to alfalfa, orchardgrass, bromegrass, or red clover. Yields of corn, small grains, and tobacco are low.

The use of these soils is limited by the hazard of erosion, droughtiness, and low productivity. These limitations are generally great enough to require that the soils be used for close-growing crops at least 4 years in 5. If the soils are cultivated, intensive management that helps control erosion and builds up and maintains productivity is required.

Lime, phosphate, and potash are required for all crops grown on these soils, and nitrogen is required for nonlegumes. Frequent, light applications of fertilizer are generally more effective than less frequent, heavier applications. The need for plant nutrients should be determined with the aid of soil tests.

The supply of organic matter is difficult to maintain, even if these soils are used for hay and pasture. The proper kinds and amounts of fertilizer, added to a good stand of grasses and legumes, help to increase productivity. Overgrazing ought to be avoided. Korean lespedeza or other annual legumes grown for hay should be followed by a winter cover crop that helps protect the soils from erosion and leaching.

Tillage is somewhat difficult because of the chert and seepage spots. It is sometimes delayed early in the growing season because of wetness. Moisture conditions for seeding grasses and legumes are often more favorable in spring than at any other time. Early seeding, however, is generally impractical.

The hazard of erosion is moderately severe if these soils are cultivated. If they are cultivated, all machine operations ought to be on the contour. Slopes longer than about 90 feet should be stripcropped or terraced. Practices that protect the soils from erosion also increase the amount of water that enters the soil and help to conserve moisture. Runoff and overwash from adjacent higher slopes is often a hazard, but diversion ditches, constructed at the base of the slopes, provide effective control. Vegetated waterways are generally needed to help prevent erosion and scouring along the natural drains. These soils are not suited to irrigation.

CAPABILITY UNIT IVw–1

This capability unit consists of poorly drained, strongly acid soils of the uplands and stream terraces. The soils are in nearly level areas or in depressions. Their surface layer is grayish-brown, mottled, friable silt loam, and the upper part of their subsoil is grayish, mottled, firm, and silty. A very firm, very compact layer, or pan, is at a depth of 10 to 24 inches. This pan restricts drainage and limits the depth to which roots can penetrate. These soils are occasionally ponded in places and are wet much of the time.

These soils are moderately low in natural fertility and in moisture-supplying capacity, and they are low in content of organic matter. Their root zone is shallow. Permeability is moderate above the upper part of the subsoil and very slow in the pan. The soils generally dry out and become droughty during midsummer. The following soils are in this unit:

Guthrie silt loam.
Robertsville silt loam.

These soils occupy about 1 percent of the county. About 5 percent of the acreage is cultivated, 45 percent is in pasture, 35 percent is wooded, and 15 percent is idle.

Because of poor drainage, these soils have a narrow suitability for crops. They are occasionally used for corn and soybeans, but yields are low and failures are common. These soils are seldom used for tobacco and small grains. They are suited to Korean lespedeza, Kobe lespe-

deza, ladino clover, alsike clover, reed canarygrass, redtop, and Kentucky 31 fescue, but they are not suited to alfalfa or to smooth bromegrass. After the soils are drained, orchardgrass, timothy, and red clover are possibly suited, but the stands are likely to be short lived.

These soils are generally too wet for cultivation, but fairly good summer pasture is produced. Even after they are drained, the soils are not very productive, because the pan is so near the surface and because the soils are droughty and low in content of organic matter. Where the soils can be sufficiently drained for row crops, good management will increase productivity.

The proper kinds and amounts of fertilizer added to thick stands of pasture plants help to increase the supply of organic matter. Overgrazing should be avoided.

Tillage is generally impractical until late in spring because the soils are too wet. It is generally more favorable to seed grasses and legumes in fall.

If suitable outlets are available, excess surface water can be removed from these soils by constructing open drainage ditches. Diversion ditches, constructed at the base of adjacent higher slopes, are effective in reducing runoff and overwash. Tile drainage is generally not feasible. Natural drains and constructed ditches should be protected from scouring by establishing perennial grasses.

CAPABILITY UNIT IVs-2

The only soil in this capability unit is Bodine cherty silt loam, 6 to 12 percent slopes. This is an excessively drained, strongly acid, sloping soil of the uplands. It has a surface layer of grayish-brown, friable cherty silt loam and a subsoil of yellowish-brown cherty silty clay loam. Chert beds are at a depth of about 15 to 25 inches.

This soil is low in natural fertility and in content of organic matter, and it is moderately low in moisture-supplying capacity. It has a moderately deep root zone and moderately rapid permeability. Chert makes this soil somewhat difficult to work and limits its moisture-holding capacity. This soil is generally very droughty.

This soil occupies about 0.4 percent of the county. About 20 percent of the acreage is cultivated, 40 percent is in pasture, 35 percent is in trees, and the rest is idle.

Because it is droughty, low in fertility, and shallow, this soil has a narrow suitability for crops. It is used for corn and tobacco, but generally only low yields are obtained. The growing of row crops has been largely discontinued on this soil. Some areas are used to grow Korean lespedeza and red clover for hay, but most areas have been seeded to Kentucky 31 fescue and lespedeza for pasture. Other plants that are fairly well suited are bermudagrass, redtop, and sericea lespedeza. Soybeans, small grains, alfalfa, orchardgrass, timothy, and smooth bromegrass are not suitable.

The use of this soil for crops is limited because of the strong slope, the hazard of erosion, droughtiness, low fertility, and content of chert. Row crops ought to be grown only about 1 year in 6, and the soil should be tilled on the contour. Close-growing crops need to be grown frequently to protect the soil from erosion, to increase the supply of organic matter, and to improve the productivity of the soil. Stripcropping is required on the longer slopes.

Lime, phosphate, and potash are required for all crops, and nitrogen is required for nonlegumes. Applying fertilizer in frequent, light applications is often more effective than applying heavier applications less frequently. The need for plant nutrients should be determined with the aid of soil tests.

The content of organic matter is difficult to maintain, even if this soil is used for hay and pasture. The proper kinds and amounts of fertilizer added to a good stand of grasses and legumes are effective in building up the supply of organic matter. Overgrazing should be avoided.

This soil is somewhat difficult to till because of the high content of chert, but it can be tilled over a fairly wide range of moisture content. The moisture in this soil is generally move favorable for spring seeding of hay and pasture than for seeding at any other time.

Erosion is the chief hazard if this soil is cultivated. All tillage ought to be done on the contour to help control erosion. If row crops are grown, stripcropping should be used on the longer slopes. Terracing is difficult because of the chert. Seeding of natural drains to perennial grasses is needed to protect the soil from scouring or gullying. This soil is not suited to irrigation.

CAPABILITY UNIT VIe-1

This capability unit consists of well-drained, medium or strongly acid soils of the uplands, foot slopes, and stream terraces. The surface layer of these soils is cherty silt loam, silt loam, cherty loam, or silty clay loam. Most of the soils are cherty, and some are only moderately deep over bedrock. Erosion is slight to moderate. These soils are strongly sloping to moderately steep. In some places their slope is irregular.

These soils are very low to moderately high in moisture-supplying capacity, moderate to low in natural fertility, and medium to low in content of organic matter. Permeability is moderately slow to moderately rapid, and the root zone is shallow to moderately deep. The hazard of erosion is severe. These soils are droughty, partly because of strong slope and rapid runoff. The soils are somewhat difficult to work because of the content of chert and the clayey surface layer of the eroded soils. The following soils are in this unit:

Baxter cherty silt loam, 20 to 30 percent slopes, eroded.
Christian-Baxter cherty loams, 20 to 30 percent slopes, eroded.
Humphreys cherty silt loam, 20 to 30 percent slopes.
Humphreys cherty silt loam, 20 to 30 percent slopes, eroded.
Humphreys cherty silt loam, shallow, 12 to 20 percent slopes, eroded.
Mountview silt loam, shallow, 12 to 20 percent slopes.
Mountview silt loam, shallow, 12 to 20 percent slopes, eroded.
Needmore silty clay loam, 12 to 20 percent slopes, eroded.

These soils occupy about 5 percent of the county. About 15 percent of the acreage is cultivated, 50 percent is pastured, 15 percent is wooded, and 20 percent is idle. Much of the acreage in pasture is unimproved.

Because of the steep slope and the severe hazard of erosion, these soils are not suited to row crops. They should be used only for pasture and forest. When the soils were first cleared, they were cultivated. Then erosion, low yields of crops, and the difficulty of using machinery on the strong slopes caused most of the acreage to be abandoned as cropland. These soils can be worked sufficiently to prepare a seedbed for permanent pasture, and they have potential for moderate yields of forage. Suitable plants are red clover, sweetclover, Korean les-

pedeza, sericea lespedeza, bermudagrass, fescue, orchardgrass, and redtop.

Lime, phosphate, potash, and nitrogen are required for a good stand of grasses and legumes. Applying a topdressing of phosphate and potash is frequently required to maintain a satisfactory stand and to obtain high yields of forage. The need for plant nutrients should be determined with the aid of soil tests.

Erosion develops rapidly and sometimes destroys newly established stands of pasture on these soils. All machine operations ought to be on the contour to reduce erosion and to increase the amount of water that enters the soil. Mulching with straw or manure and applying fertilizer liberally are often required to establish a good stand on the severely eroded areas. If reseeding is necessary, erosion can be minimized on the longer slopes by reseeding a strip at a time over a period of 2 years or more. Careful control of grazing is needed.

CAPABILITY UNIT VIe-2

This capability unit consists of well-drained, medium or strongly acid, strongly sloping soils of the uplands. The soils have a surface layer of silty clay loam and a red, clayey subsoil. In many places the surface layer contains chert. The soils are severely eroded. There are shallow gullies in most of the areas and deep gullies in some of the areas.

These soils are moderately low in natural fertility, moderately high to low in moisture-supplying capacity, and low in content of organic matter. Permeability is moderate, and the root zone is moderately deep or deep. The hazard of further erosion is severe. Because of the strong slope, rapid runoff, and severe erosion, these soils are droughty. They are somewhat difficult to work because of the chert and because the present surface layer is clayey material that was formerly part of the subsoil. The following soils are in this unit:

- Baxter cherty silty clay loam, 12 to 20 percent slopes, severely eroded.
- Christian silty clay loam, 12 to 20 percent slopes, severely eroded.

These soils occupy about 0.8 percent of the county. Only about 5 percent of the acreage is cultivated, about 40 percent is in pasture, 15 percent is wooded, and 40 percent is idle. The acreage in pasture is generally unimproved. The wooded areas have been abandoned for crops for several years. The trees in the wooded areas are mostly Virginia pines.

Because of the strong slope, severe erosion, and the hazard of further erosion, these soils are not suited to cultivated crops. Their use is limited to pasture and forest. When they were first cleared, these soils were fairly productive for crops, but severe erosion and reduced yields have caused gradual abandonment to pasture. The soils can be worked sufficiently to prepare a seedbed for permanent pasture, although they have potential for only a moderately low yield of forage. The most suitable plants are sericea lespedeza, Korean lespedeza, bermudagrass, and Kentucky 31 fescue.

Lime, phosphate, potash, and nitrogen are required to establish a good stand of grasses and legumes on these soils. Supplying a topdressing of phosphate and potash frequently is required to maintain a satisfactory stand and good yields of forage. The need for plant nutrients should be determined with the aid of soil tests.

These soils are generally difficult to work to a good seedbed. They are generally cloddy when disturbed, and the clods are not easy to pulverize. In many places fall seeding may be delayed until rains have added enough moisture that the soils can be turned. Therefore, seeding is often late. Moisture is generally more favorable for spring seeding than for seeding at any other time.

Runoff develops rapidly and sometimes destroys newly established stands of pasture on these soils. All machine operations should be on the contour to reduce the amount of erosion and to increase the amount of water that enters the soil. Mulching with straw or manure and applying fertilizer liberally are often required if a good stand is to be obtained. If reseeding becomes necessary, erosion can be minimized on the longer slopes by reseeding a strip at a time over a period of 2 years or more. Grazing ought to be delayed until a good cover is established. Overgrazing should be avoided.

CAPABILITY UNIT VIe-8

This capability unit consists of moderately well drained to excessively drained, nearly neutral to strongly acid, strongly sloping soils of the uplands and foot slopes. These soils are shallow or moderately deep over shaly bedrock or a compact, cherty pan. The surface layer is shaly silt loam, cherty silt loam, or silt loam. In most places the subsoil is silty and also shaly or cherty, but in some places it is clayey. Erosion is slight to moderate.

These soils are moderately low or low in natural fertility and low or very low in moisture-supplying capacity. They are moderately to slowly permeable and medium to very low in content of organic matter. Their root zone is shallow. These soils are droughty, partly because of their strong slope and the high rate of runoff, and they are also low in moisture-holding capacity. In many places chert or shale in the surface layer interferes with tillage. The following soils are in this unit:

- Landisburg cherty silt loam, 12 to 20 percent slopes, eroded.
- Rockcastle silt loam, 12 to 20 percent slopes.
- Westmoreland shaly silt loam, 12 to 20 percent slopes.

These soils occupy about 2 percent of the county. Only about 2 percent of the acreage is cultivated, 30 percent is in pasture, 50 percent is wooded, and about 18 percent is idle. Much of the acreage in pasture is unimproved. The dominant trees in the wooded areas are oak, hickory, and cedar. In areas that are cultivated, yields of crops are low.

Because these soils are strongly sloping, shallow, low in fertility, and droughty, they are not suited to field crops. They should be used only for pasture or forest. The soils can be worked enough to obtain a seedbed for permanent pasture, but the potential yield of forage is only moderately low. The soils are probably best suited to Korean lespedeza, sericea lespedeza, bermudagrass, and Kentucky 31 fescue. Red clover, ladino clover, redtop, and orchardgrass are slightly less well suited, although under good management they can be grown successfully. The Westmoreland soil is the most suitable for pasture.

Generally, lime is not required on the Westmoreland soil, but heavy applications are required on the Landisburg and Rockcastle soils. Phosphate, potash, and

nitrogen are required to establish a good stand of grasses and legumes. Frequent topdressing with potash and phosphate is required to maintain a satisfactory stand and good yields of forage. Frequent, light applications of fertilizer are often more effective than less frequent and heavier applications. The need for plant nutrients should be determined with the aid of soil tests.

Erosion develops rapidly and sometimes destroys a newly established stand on these soils. All machine operations should be on the contour to reduce the amount of erosion and to increase the amount of water that enters the soil. If reseeding becomes necessary, erosion can be minimized on the longer slopes by reseeding a strip at a time over a period of 2 years or more. Grazing ought to be delayed until the stand is well established, and overgrazing should be avoided. The content of moisture in the soils is generally more favorable for tilling and seeding in spring than at any other time.

CAPABILITY UNIT VIs-1

This capability unit consists of very rocky, well-drained, strongly acid, eroded soils of the uplands. These soils are strongly sloping. They have a silty or sandy surface layer and a very firm, red, clayey subsoil. In places the present surface layer is red clayey material that was formerly part of the subsoil.

These soils are moderate in natural fertility and low in content of organic matter. Their moisture-supplying capacity is low. The soils have a shallow to moderately deep root zone. Outcrops of rock interfere with the use of farming equipment. These soils are moderately droughty because of the rapid runoff and somewhat slow rate of infiltration. The following soils are in this unit:

Christian very rocky soils, 8 to 20 percent slopes, eroded.
Talbott very rocky silt loam, 12 to 20 percent slopes, eroded.

These soils occupy about 2 percent of the county. All of the acreage has been cleared and used for crops. The soils can be tilled fairly easily if horse-drawn equipment is used, but tractor-drawn equipment is more difficult to operate. Some areas are used for pasture, but a large part of the acreage is idle, and some areas are reverting to timber.

The strong slope, hazard of erosion, and rock outcrops make these soils unsuitable for field crops. They should be used only for pasture or trees.

The number of rock outcrops is somewhat variable, but in most places the soils can be worked sufficiently to prepare a seedbed for permanent pasture. The potential yield of forage is moderate. Grasses and legumes that are suitable are bermudagrass, Kentucky 31 fescue, orchardgrass, redtop, red clover, sweetclover, Korean lespedeza, and sericea lespedeza.

Lime, phosphate, potash, and nitrogen are required to establish a good stand of grasses and legumes. Frequent topdressing with phosphate and potash is necessary to maintain a good, productive stand. The need for plant nutrients should be determined with the aid of soil tests.

In many places a good seedbed is difficult to prepare because of the many rock outcrops that interfere with the movement of equipment. In places the soils can be tilled only within a narrow range of moisture content because of the red, clayey material in the surface layer.

Erosion develops rapidly in these soils. It sometimes keeps a stand of pasture from becoming established. All machine operations should be on the contour to reduce the amount of erosion and to increase the amount of water that enters the soil. Mulching with straw or manure and applying fertilizer liberally are required if a good stand is to be obtained. Grazing ought to be delayed until a good cover is established, and overgrazing should be avoided.

CAPABILITY UNIT VIs-3

Only one soil—Bodine cherty silt loam, 12 to 20 percent slopes—is in this capability unit. This is an excessively drained, strongly acid, strongly sloping soil of the uplands. It has a surface layer of grayish-brown cherty silt loam and a subsoil of yellowish-brown cherty silty clay loam. Chert beds are at a depth of 12 to 20 inches.

This soil is low in natural fertility and moderately low in moisture-supplying capacity. It has a shallow to moderately deep root zone. The content of organic matter is low. The soil is rapid in permeability and is droughty. It is somewhat difficult to work because of the large amount of chert.

This soil occupies about 1 percent of the county. Only a very small acreage is cultivated. A fairly large acreage is in low-quality pasture, and more than half of the acreage is in trees. If this soil is cultivated, crop yields are generally low because the soil is droughty and low in fertility. This soil should be used only for pasture or trees.

This soil is fairly easy to till enough to get a seedbed for pasture plants, but the potential yield of forage is low because the soil is droughty. Those plants most suitable are Korean lespedeza, sericea lespedeza, Kentucky 31 fescue, bermudagrass, and redtop. This soil is not well suited to smooth bromegrass, orchardgrass, timothy, alsike clover, ladino clover, and sweetclover.

Lime, phosphate, potash, and nitrogen are required to establish a good stand of grasses and legumes. Frequent topdressing with phosphate and potash is required to maintain the stand. Lighter and more frequent applications of fertilizer are generally more effective than heavier and less frequent applications. The need for these plant nutrients should be determined with the aid of soil tests.

This soil can be tilled over a fairly wide range of moisture content. Because it is droughty, however, the content of moisture is often more favorable for spring seeding than for seeding at any other time.

Erosion is a hazard on this soil and sometimes damages a newly established stand of pasture. All machine operations should be on the contour to reduce the amount of erosion and to increase the amount of water that enters the soil. Grazing ought to be delayed until a good cover is established, and overgrazing should be avoided.

CAPABILITY UNIT VIIe-1

This capability unit consists of well-drained to excessively drained, medium or strongly acid, moderately steep soils of the uplands. These soils are severely eroded and have a red, clayey, cherty subsoil, or they are somewhat sandy and shallow over bedrock.

The soils in this unit are moderately low or low in moisture-supplying capacity and moderate to rapid in permeability. Runoff is very rapid and the soils are droughty. The content of organic matter is low or very low. The

root zone is moderately deep. The hazard of erosion is severe. The following soils are in this unit:

Baxter cherty silty clay loam, 20 to 30 percent slopes, severely eroded.
Christian-Baxter cherty loams, 20 to 30 percent slopes, severely eroded.
Muskingum very fine sandy loam, 18 to 30 percent slopes.

These soils occupy about 0.8 percent of the county. The Muskingum soil is practically all wooded. At one time the Baxter and Christian soils were cleared and used for crops, but now they are severely eroded and have been abandoned for crops. Some of the acreage is in low-quality pasture, and the rest is mostly idle. Tree seedlings have been planted on a small acreage, and some areas have reverted naturally to trees.

Because these soils have steep slopes, are easily eroded, and are droughty and low in fertility, their use is restricted to forest, wildlife, and limited grazing. Erosion is difficult to control if these soils are used for pasture. Probably they are best suited to trees. Information about reforesting soils and managing stands of timber can be found in the section "Woodland Uses of Soils."

On these soils it is generally impractical to apply practices to improve the pastures, such as seeding, liming, and fertilizing. Some areas, however, need seeding, as this protects them from erosion and prevents damage to adjoining areas. These soils have a narrow suitability for pasture plants; Kentucky 31 fescue, redtop, and sericea lespedeza are the most suitable pasture plants. Lime, phosphate, potash, and nitrogen are needed to establish pasture on these critical areas. Mulching with straw or manure reduces erosion while the stand is becoming established. Most grazing ought to be confined to the native vegetation. Special care should be taken to prevent overgrazing.

CAPABILITY UNIT VIIe-2

This capability unit consists of well-drained to excessively drained, nearly neutral to strongly acid, strongly sloping to steep soils of the uplands. The surface layer is shaly silt loam, silt loam, or silty clay, and the subsoil is shaly or clayey. These soils are shallow over bedrock, and erosion is slight to severe.

These soils are moderately low or low in natural fertility, low or very low in moisture-supplying capacity, and medium to very low in content of organic matter. Their root zone is shallow. Permeability is moderate to slow, runoff is very rapid, and infiltration is somewhat slow. The soils are extremely droughty. The hazard of erosion is severe or very severe. The following soils are in this unit:

Needmore silty clay, 8 to 20 percent slopes, severely eroded.
Rockcastle silt loam, 20 to 30 percent slopes.
Rockcastle silt loam, 30 to 40 percent slopes.
Westmoreland shaly silt loam, 20 to 30 percent slopes.
Westmoreland shaly silt loam, 30 to 55 percent slopes.

These soils occupy about 14 percent of the county. The Needmore soil was once cleared and cultivated, but erosion has caused it to be abandoned for crops. Approximately 20 percent of the acreage of Rockcastle and Westmoreland soils was once cleared and used for cultivated crops, but yields were low, and these areas have since been abandoned for crops. A small acreage of the cleared areas is now in unimproved pasture, but most of it is idle. More than 80 percent of the acreage of these soils is in trees. The trees are mainly upland oaks, cedar, and hickory.

These soils are restricted in use to trees, wildlife, or limited grazing. This is because they are droughty and because of the very severe hazard of erosion, shallow root zone, low fertility, and steep slope. These soils are probably best suited to trees and wildlife. Information about reforesting these soils and managing stands of timber can be found in the section "Woodland Uses of Soils."

On the steeper slopes use of the equipment needed to prepare a seedbed for pasture is almost impossible. On slopes of less than about 25 percent, such equipment can be used to a limited extent, but erosion cannot be controlled effectively while the seedbed is being prepared. Some areas, however, may be seeded to provide protection from further erosion and to prevent damage to adjoining areas. These critical areas will need a complete fertilizer and mulching with straw or manure. A good stand is difficult to obtain, and maintenance operations often cannot be carried out effectively. Overgrazing should be avoided.

The range of suitable pasture plants is narrow on these soils. The most suitable plants are sweetclover, sericea lespedeza, Kentucky 31 fescue, and redtop. Generally, it is impractical to graze any of the areas except those in native vegetation.

CAPABILITY UNIT VIIe-3

This capability unit consists of somewhat excessively drained, nearly neutral, severely eroded soils. These soils are strongly sloping to very steep and are on the uplands. They have a surface layer of shaly silt loam and a subsoil of shaly silty clay loam. Shaly bedrock is at a depth of 8 to 12 inches or less.

These soils are moderately low in natural fertility, very low in moisture-supplying capacity, and low in content of organic matter. Permeability is moderate. The root zone is very shallow, and the soils are extremely droughty. The hazard of erosion is severe or very severe, and shale bedrock is exposed in places. These soils contain shallow gullies. They are difficult to till because the bedrock is so near the surface and because they contain a large amount of shale. The following soils are in this unit:

Westmoreland shaly silty clay loam, 12 to 30 percent slopes, severely eroded.
Westmoreland shaly silty clay loam, 30 to 50 percent slopes, severely eroded.

These soils occupy about 3 percent of the county. All of the acreage has been cleared and used for crops, but now it is mostly idle or in unimproved pasture. A small acreage is in trees; the principal kind of tree is redcedar.

The use of these soils is restricted to forest and wildlife. This is because the soils are droughty and because of the steep slopes, severe hazard of erosion, shallow root zone, and low fertility. Control of erosion is difficult if these soils are used for pasture. The soils are probably best suited to forest. Information about reforesting the soils and managing the stands of timber can be found in the section "Woodland Uses of Soils."

CAPABILITY UNIT VIIe-4

Only Gullied land is in this capability unit. This miscellaneous land type is very severely eroded. It contains deep gullies, and in places bedrock is exposed. Some areas

between the gullies are only moderately eroded. In most places, however, the present surface layer is made up of soil material that was formerly part of the subsoil, or the parent material is exposed. The present surface layer is mainly red and clayey, but in places it is gray clay. This land type occupies upland positions. In most places the slope is moderately steep or steep.

Gullied land occupies about 0.5 percent of the county. Many of the areas were once productive of crops and pasture, but they have been abandoned because of very severe erosion. They are now either idle or gradually reverting to trees. Some areas are in Virginia pine, and others are in redcedar or brush.

Gully and sheet erosion have damaged this soil to the extent that it cannot be used for pasture. It is suited only to trees and wildlife. Information about reforesting the areas and managing the stands of timber can be found in the section "Woodland Uses of Soils."

CAPABILITY UNIT VIIs-1

This capability unit consists of somewhat excessively drained or excessively drained, strongly acid, moderately steep or steep soils of the uplands. The soils have a surface layer of cherty or shaly silt loam and a subsoil of cherty or shaly silt loam or silty clay loam. The depth to chert beds or shale is about 10 to 20 inches. Most areas of these soils are only slightly eroded, but some areas are moderately eroded.

These soils have a shallow root zone, moderately low to very low moisture-supplying capacity, and moderately rapid or rapid permeability. They are medium to low in content of organic matter. The hazard of erosion is severe or very severe. Because of the steep slope, rapid runoff, and low moisture-holding capacity, these soils are extremely droughty. The following soils are in this unit:

Bodine cherty silt loam, 20 to 30 percent slopes.
Bodine cherty silt loam, 30 to 50 percent slopes.
Colyer shaly silt loam, 12 to 30 percent slopes.

These soils occupy about 6 percent of the county. A small acreage of the Colyer soil has been cultivated, but it is eroded and is now mostly idle or in low-quality pasture. A somewhat larger acreage of the Bodine soils was once cleared and cultivated, but most of these areas are now in low-quality pasture, are idle, or have reverted to trees. About 75 percent of the total acreage of these soils is in trees.

Because rock is near the surface of these soils and because the soils are droughty, steep, and low in fertility, their use is restricted to forest, wildlife, and limited grazing. Controlling erosion is extremely difficult if the soils are used for pasture, and the soils are probably best suited to forest. Information about reforesting the soils and managing the stands of timber can be found in the section "Woodland Uses of Soils."

These soils have a very narrow range of suitability for plants; most grasses and legumes are either not adapted or the stand is short lived. The lespedezas, Kentucky 31 fescue, and bermudagrass are perhaps most likely to be fairly successful.

Lime, phosphate, potash, and nitrogen are required for establishing pasture on areas that need seeding that will protect them from erosion and prevent damage to adjoining areas. These areas usually require a mulch until a stand of grass is established. Generally, it is not feasible to pasture anything but the native vegetation. Overgrazing should be avoided.

CAPABILITY UNIT VIIs-2

This capability unit consists of well-drained, strongly acid, strongly sloping to steep soils of the uplands. These soils have a very rocky, sandy or clayey surface layer and a firm, plastic, red, clayey subsoil. Erosion is moderate to severe, and there are occasional deep gullies.

These soils have moderately low natural fertility, low or very low moisture-supplying capacity, and a shallow root zone. Permeability is moderately slow. The soils are low or very low in content of organic matter. The hazard of erosion is severe or very severe. Because of the rapid runoff, low rate of infiltration, and steep slopes, these soils are droughty. Outcrops of limestone and the steep slopes make the use of equipment difficult. The following soils are in this unit:

Caneyville very rocky soils, 20 to 30 percent slopes, eroded.
Caneyville very rocky soils, 20 to 30 percent slopes, severely eroded.
Caneyville very rocky soils, 30 to 45 percent slopes, eroded.
Caneyville very rocky soils, 30 to 45 percent slopes, severely eroded.
Christian very rocky soils, 12 to 20 percent slopes, severely eroded.
Talbott very rocky silt loam, 20 to 30 percent slopes, eroded.
Talbott very rocky silty clay, 12 to 20 percent slopes, severely eroded.
Talbott very rocky silty clay, 20 to 30 percent slopes, severely eroded.

These soils occupy about 7 percent of the county. Nearly all of the acreage was once cleared and cultivated. The resulting erosion and exposure of additional rock outcrops and the lowered productivity have caused the soils to be abandoned for cultivated crops. Some of the acreage is now in low-quality pasture, but most of it is idle. Some of it has been reforested.

Rock outcrops, severe erosion and the severe hazard of further erosion, steep slopes, droughtiness, and a shallow root zone limit the use of these soils to woodland, wildlife, and limited grazing. Controlling erosion is extremely difficult if these soils are used for pasture, and the rock outcrops limit their development for pasture. These soils are best suited to forest. Information about reforesting and managing the stands of timber can be found in the section "Woodland Uses of Soils."

These soils have a very narrow range of suitability for plants; most grasses and legumes are either not adapted or the stand is short lived. The lespedezas, Kentucky 31 fescue, and bermudagrass are perhaps most likely to be fairly successful. Applying practices to improve the pastures, such as seeding, liming, and fertilizing, is impractical. Small critical areas need seeding, fertilizing, and mulching that will protect them from erosion and help to prevent damage to adjoining areas.

CAPABILITY UNIT VIIs-5

Rock land is the only land type in this capability unit. It consists mostly of rock outcrops. In many places soil material between the outcrops is moderately fertile, and

in places it contains a large amount of organic matter. In most places the subsoil is red and clayey. Many areas are moderately eroded, and a few are severely eroded. Rock outcrops cover from 25 to about 90 percent of the surface and prohibit the use of machinery for tillage. This land is mainly strongly sloping to moderately steep.

Rock land covers about 0.3 percent of the county. Most of the acreage is in trees, but a few areas are in wild pasture and some are idle.

The rock outcrops restrict the use to woodland and wildlife. Information about reforesting and managing the stands of timber can be found in the section "Woodland Uses of Soils."

CAPABILITY UNIT VIIIs-1

Rock outcrop is in this capability unit. The rock outcrops restrict use primarily to wildlife and recreation. The areas are composed mostly of rock ledges and bluffs; rock outcrop occupies more than 90 percent of the surface area. There is enough soil material to support some shrubs and a few trees, but the vegetation is scanty.

Rock outcrop occupies about 0.1 percent of the county. To protect the more valuable soils and to control water, it should be protected from fire and grazing. Areas of Rock outcrop should be used for wildlife or for esthetic purposes.

Estimated Yields

Table 2 lists the soils of Adair County that are used for crops, and it gives the estimated average acre yields that may be expected of the principal crops grown under a high level of management. A high level of management consists of using the practices described in the sections "General Management" and "Management by Capability Units." These practices generally help control erosion, improve the structure of the soils, build up the supply of organic matter, and increase productivity.

TABLE 2.—*Estimated average acre yields of the principal crops grown under a high level of management*

[Absence of yield figure indicates soil is not suited to the crop specified]

Soil	Corn	Tobacco	Wheat	Alfalfa	Red clover (first year)	Red clover (second year)	Lespedeza	Pasture
	Bu.	*Lb.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [1]
Baxter cherty silt loam, 6 to 12 percent slopes	79	1, 690	31	3. 0	1. 1	2. 9	1. 7	170
Baxter cherty silt loam, 2 to 6 percent slopes	85	1, 790	35	3. 2	1. 1	3. 0	1. 7	175
Baxter cherty silt loam, 6 to 12 percent slopes, eroded	70	1, 450	28	2. 7	1. 0	2. 7	1. 4	160
Baxter cherty silt loam, 12 to 20 percent slopes	60	1, 350	25	2. 9	1. 1	2. 8	1. 5	165
Baxter cherty silt loam, 12 to 20 percent slopes, eroded	56	1, 200	22	2. 5	1. 0	2. 6	1. 3	155
Baxter cherty silty clay loam, 12 to 20 percent slopes, severely eroded					. 8	2. 0	1. 0	120
Baxter cherty silt loam, 20 to 30 percent slopes, eroded								150
Baxter cherty silty clay loam, 20 to 30 percent slopes, severely eroded								110
Bewleyville silt loam, 2 to 6 percent slopes	95	2, 100	40	3. 7	1. 1	3. 0	2. 0	185
Bewleyville silt loam, 6 to 12 percent slopes	90	1, 950	35	3. 5	1. 1	3. 0	2. 0	180
Bewleyville silt loam, 6 to 12 percent slopes, eroded	82	1, 700	31	3. 3	1. 1	3. 0	1. 9	170
Bodine cherty silt loam, 6 to 12 percent slopes	38	1, 450	12	2. 5	. 8	2. 1	1. 5	135
Bodine cherty silt loam, 12 to 20 percent slopes			10	2. 4	. 8	2. 0	1. 3	150
Bodine cherty silt loam, 20 to 30 percent slopes								135
Bodine cherty silt loam, 30 to 50 percent slopes								
Bruno loamy fine sand	50	1, 400	19	2. 0	. 7	1. 8	1. 1	125
Caneyville very rocky soils, 20 to 30 percent slopes, eroded								105
Caneyville very rocky soils, 20 to 30 percent slopes, severely eroded								90
Caneyville very rocky soils, 30 to 45 percent slopes, eroded								95
Caneyville very rocky soils, 30 to 45 percent slopes, severely eroded								75
Captina silt loam, 2 to 6 percent slopes	80	2, 000	30	2. 5	1. 1	2. 8	2. 0	170
Christian silt loam, 2 to 6 percent slopes	85	2, 050	34	3. 2	1. 0	2. 7	2. 0	170
Christian silt loam, 6 to 12 percent slopes	81	2, 000	30	3. 0	1. 0	2. 6	1. 9	165
Christian silt loam, 6 to 12 percent slopes, eroded	75	1, 800	27	2. 8	. 9	2. 3	1. 7	155
Christian silty clay loam, 6 to 12 percent slopes, severely eroded	50	1, 500	20	2. 2	. 8	1. 8	1. 4	120
Christian silt loam, 12 to 20 percent slopes		1, 700	24	2. 7	. 9	2. 5	1. 6	155
Christian silt loam, 12 to 20 percent slopes, eroded		1, 550	15	2. 4	. 8	2. 2		145
Christian silty clay loam, 12 to 20 percent slopes, severely eroded			15	2. 1	. 7	1. 8	1. 3	120
Christian fine sandy loam, 6 to 12 percent slopes, eroded	60	1, 350	25	2. 5	. 7	1. 8	1. 4	140
Christian fine sandy loam, 12 to 20 percent slopes, eroded	55	1, 200		2. 3	. 6	1. 7	1. 2	120
Christian very rocky soils, 8 to 20 percent slopes, eroded				2. 1	. 7	1. 7	1. 0	105
Christian very rocky soils, 12 to 20 percent slopes, severely eroded				1. 4	. 6	1. 2	. 7	80
Christian-Baxter cherty loams, 6 to 12 percent slopes, eroded	70	1, 525	29	2. 6	1. 1	2. 7	1. 4	160

See footnote at end of table.

TABLE 2.—*Estimated average acre yields of the principal crops grown under a high level of management*—Continued

Soil	Corn	Tobacco	Wheat	Alfalfa	Red clover (first year)	Red clover (second year)	Lespedeza	Pasture
	Bu.	*Lb.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [1]
Christian-Baxter cherty loams, 12 to 20 percent slopes, eroded	65	1,200	25	2.4	1.0	2.6	1.3	155
Christian-Baxter cherty loams, 20 to 30 percent slopes, eroded								135
Christian-Baxter cherty loams, 20 to 30 percent slopes, severely eroded								105
Colyer shaly silt loam, 12 to 30 percent slopes								85
Cookeville silt loam, 6 to 12 percent slopes, eroded	75	1,700	30	3.4	1.1	3.0	1.9	170
Dickson silt loam, 2 to 6 percent slopes	80	1,800	30	2.6	1.1	3.0	1.9	165
Dunning silt loam	100		35	3.2	1.1	2.8	2.0	175
Etowah silt loam, 2 to 6 percent slopes	95	2,150	40	3.8	1.1	3.0	2.0	185
Etowah silt loam, 6 to 12 percent slopes	90	1,950	35	3.7	1.1	3.0	2.0	180
Frankstown cherty silt loam, 6 to 12 percent slopes	64	1,650	26	3.1	1.1	2.8	1.7	150
Frankstown cherty silt loam, 2 to 6 percent slopes	70	1,700	30	3.2	1.1	2.9	1.7	160
Frankstown cherty silt loam, 6 to 12 percent slopes, eroded	56	1,350	20	3.0	1.0	2.6	1.6	140
Frankstown cherty silt loam, 12 to 20 percent slopes	58	1,320		3.0	1.1	2.7	1.7	150
Frankstown cherty silt loam, 12 to 20 percent slopes, eroded	50	1,200		2.8	1.0	2.5	1.5	135
Gullied land								
Guthrie silt loam	40						1.3	150
Humphreys cherty silt loam, 2 to 6 percent slopes	75	1,750	30	3.5	1.1	3.0	1.8	170
Humphreys cherty silt loam, 6 to 12 percent slopes	70	1,650	26	3.1	1.1	2.9	1.8	160
Humphreys cherty silt loam, 6 to 12 percent slopes, eroded	60	1,400	22	3.0	1.0	2.7	1.7	150
Humphreys cherty silt loam, 12 to 20 percent slopes, eroded	55	1,300	18	2.8	.9	2.3	1.6	145
Humphreys cherty silt loam, shallow, 12 to 20 percent slopes, eroded				2.6	.9	2.2	1.4	140
Humphreys cherty silt loam, 20 to 30 percent slopes				2.5	.8	2.0	1.5	145
Humphreys cherty silt loam, 20 to 30 percent slopes, eroded				2.0	.8	1.8	1.2	140
Humphreys silt loam, 6 to 12 percent slopes	80	1,800	30	3.2	1.1	3.0	1.9	165
Huntington silt loam	110	2,100	45	4.0	1.1	3.0	2.0	195
Huntington fine sandy loam	90	1,575	40	3.4	1.1	3.0	1.8	170
Huntington gravelly loam	70	1,400	25				1.9	175
Landisburg cherty silt loam, 0 to 2 percent slopes	45	1,300	15				1.6	150
Landisburg cherty silt loam, 2 to 6 percent slopes	45	1,450	15				1.6	150
Landisburg cherty silt loam, 6 to 12 percent slopes	41	1,350	12				1.5	140
Landisburg cherty silt loam, 6 to 12 percent slopes, eroded	35	1,100	10				1.4	125
Landisburg cherty silt loam, 12 to 20 percent slopes, eroded							1.4	125
Landisburg silt loam, 0 to 2 percent slopes	55	1,500	18				1.7	165
Landisburg silt loam, 2 to 6 percent slopes	55	1,600	20				1.7	160
Landisburg silt loam, 6 to 12 percent slopes	51	1,500	15				1.5	145
Landisburg silt loam, 6 to 12 percent slopes, eroded	40	1,450	15				1.3	135
Lawrence silt loam	55	1,200	20		.9	1.9	1.6	160
Lindside silt loam	100	1,900	35	3.3	1.1	3.0	2.0	195
Melvin silt loam	70	1,200	25				1.8	170
Mountview silt loam, 6 to 12 percent slopes	70	1,775	30	3.3	1.1	3.0	2.0	175
Mountview silt loam, 2 to 6 percent slopes	75	1,900	30	3.6	1.1	3.0	2.0	180
Mountview silt loam, 6 to 12 percent slopes, eroded	55	1,675	22	3.1	1.1	2.9	1.9	165
Mountview silt loam, shallow, 2 to 6 percent slopes	70	1,850	29	3.3	1.1	3.0	2.0	165
Mountview silt loam, shallow, 6 to 12 percent slopes	60	1,600	25	3.0	1.1	2.9	1.9	160
Mountview silt loam, shallow, 6 to 12 percent slopes, eroded	55	1,400	20	2.9	1.1	2.8	1.8	150
Mountview silt loam, shallow, 12 to 20 percent slopes				3.0	1.1	2.7	1.8	155
Mountview silt loam, shallow, 12 to 20 percent slopes, eroded				2.8	1.0	2.6	1.6	145
Muskingum very fine sandy loam, 18 to 30 percent slopes								120
Needmore silt loam, 6 to 12 percent slopes	50	1,525	19	2.8	1.0	2.6	1.8	160
Needmore silt loam, 2 to 6 percent slopes	55	1,650	20	2.9	2.7		1.9	165
Needmore silty clay loam, 2 to 6 percent slopes, eroded	45	1,500	20	2.7	.9	2.5	1.7	155
Needmore silty clay loam, 6 to 12 percent slopes, eroded	40	1,300	16	2.5	.9	2.3	1.7	150
Needmore silty clay loam, 12 to 20 percent slopes, eroded				2.4	.8	2.1	1.5	140
Needmore silty clay, 8 to 20 percent slopes, severely eroded								115
Newark silt loam	85	1,700	30	3.1	.9	2.5	1.8	185
Newark gravelly silt loam	60	1,450	20	2.8	.8	2.0	1.8	170
Pembroke silt loam, 2 to 6 percent slopes	100	2,250	40	4.0	1.1	3.0	2.0	185
Pembroke silt loam, 6 to 12 percent slopes	96	2,100	38	3.8	1.1	3.0	2.0	180
Robertsville silt loam	40	1,100					1.6	150
Rockcastle silt loam, 20 to 30 percent slopes								95
Rockcastle silt loam, 12 to 20 percent slopes			10				1.0	100
Rockcastle silt loam, 30 to 40 percent slopes								45
Rock land								
Rock outcrop								

See footnote at end of table.

TABLE 2.—*Estimated average acre yields of the principal crops grown under a high level of management*—Continued

Soil	Corn	Tobacco	Wheat	Alfalfa	Red clover (first year)	Red clover (second year)	Lespedeza	Pasture
	Bu.	*Lb.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Cow-acre-days* [1]
Sango silt loam, 0 to 2 percent slopes	68	1,650	20	2.2	.9	2.5	1.6	155
Sango silt loam, 2 to 6 percent slopes	66	1,850	24	2.4	1.0	2.6	1.7	160
Sequatchie silt loam, 0 to 4 percent slopes	95	2,150	38	3.8	1.1	3.0	2.0	190
Staser silt loam	105	2,100	45	4.0	1.1	3.0	2.0	190
Staser loam	105	2,050	39	3.9	1.1	3.0	2.0	185
Staser gravelly loam	80	2,000	30	3.7	1.1	2.9	1.9	180
Taft silt loam	55	1,475	15	----	----	----	1.7	155
Talbott silt loam, 6 to 12 percent slopes, eroded	50	1,350	20	2.8	.9	2.4	1.7	140
Talbott very rocky silt loam, 12 to 20 percent slopes, eroded	----	----	----	2.5	.8	2.1	1.3	115
Talbott very rocky silty clay, 12 to 20 percent slopes, severely eroded	----	----	----	----	----	----	----	90
Talbott very rocky silt loam, 20 to 30 percent slopes, eroded	----	----	----	----	----	----	----	95
Talbott very rocky silty clay, 20 to 30 percent slopes, severely eroded	----	----	----	----	----	----	----	85
Westmoreland shaly silt loam, 12 to 20 percent slopes	----	----	----	----	.8	2.0	----	80
Westmoreland shaly silt loam, 2 to 6 percent slopes	45	1,525	21	2.5	.9	2.3	1.4	135
Westmoreland shaly silt loam, 6 to 12 percent slopes	40	1,350	16	2.4	.8	2.1	1.3	125
Westmoreland shaly silt loam, 20 to 30 percent slopes	----	----	----	----	----	----	----	75
Westmoreland shaly silt loam, 30 to 55 percent slopes	----	----	----	----	----	----	----	70
Westmoreland shaly silty clay loam, 12 to 30 percent slopes, severely eroded	----	----	----	----	----	----	----	65
Westmoreland shaly silty clay loam, 30 to 50 percent slopes, severely eroded	----	----	----	----	----	----	----	65
Whitwell silt loam	75	1,450	29	2.6	.9	2.3	2.0	180
Wolftever silt loam	95	1,675	38	2.7	.9	2.4	2.0	185

[1] The number of days that 1 acre will support one animal unit (one cow, steer, or horse; five hogs; or seven sheep or goats) without injury to the pasture.

The management used to obtain the yields given in the table also includes the following practices:

1. Using adapted varieties of plants that give high yields and that resist disease.
2. Seeding or planting at the proper time, according to approved methods, and using the proper amount of seed or the proper number of plants.
3. Selecting crops and crop rotations that return organic residues to the soils and thus add organic matter, that maintain or improve the structure of the soils, and that help to prevent erosion.
4. Controlling excess water by draining the soils, providing vegetated waterways and diversion ditches, constructing terraces, tilling on the contour, and using stripcropping.
5. Inoculating legumes.
6. Controlling weeds, insects, and plant diseases.
7. Using shallow cultivation.
8. Applying adequate amounts of lime, where needed.
9. Protecting the soils from overgrazing.
10. Using suitable practices for harvesting.

In table 2 estimated yields are listed only for the soils considered to be suitable for a particular crop; for example, estimates of corn yields were not given for soils in capability class VI, because those soils are eroded, steep, rocky, shallow, or have some other limitation that makes them unsuited to cultivated crops.

The estimates in table 2 are based on yields obtained on soils that had not been irrigated and that had received the average amount of rainfall over a long period of time. Because the frequency of flooding and the amount of damage caused by flooding vary, flooding was not taken into consideration in estimating the yields.

Woodland Uses of Soils

At the time of settlement, nearly all of the area that is now Adair County was in forest. The soils of the lowlands and plateaus supported yellow-poplar, oak, cherry, walnut, beech, sugar maple, and other desirable hardwoods. The steeper slopes between the lowlands and plateaus generally supported redcedars and oaks and hickories of low to fair quality.

By 1961, only small areas of the lowlands remained in trees and many small areas of woodland remained on the plateaus. About half of the areas of woodland on the plateaus receive fair to good management and produce fair- to good-quality hardwoods. Nearly all of the steeper slopes between the lowlands and plateaus remain in trees, mainly low-quality oaks and hickories. These areas of woodland have been damaged severely by the grazing of livestock and by repeated burning.

Except for the chestnut blight, no epidemic attacks of insects or diseases that seriously damage the trees in wooded areas have occurred in this county. Large losses are caused annually, however, by insects that bore into the trees or by insects or animals that scar the bark. Oaks have been damaged the most extensively. Another important loss is caused by heart rot, which results mainly from scars caused by fire.

Fair markets exist for fair- to high-quality woodland products. Second-growth oaks and yellow-poplars that have a fairly large diameter are being logged. The marketing situation is poor for low-grade woodland products.

Woodland suitability groups

The following pages give information concerning the effect of the many different kinds of soils on woodland use and management. This information is based on studies made in the field and on the results of research. It is also based on the experience and judgment of soil scientists, woodland conservationists, foresters, and local landowners. To simplify the presentation and understanding of the information, soils that are similar, according to certain interpretations, have been placed in woodland suitability groups. Each woodland suitability group contains soils that (1) produce similar kinds of wood crops or perform about the same under similar kinds of woodland management, (2) require similar kinds of conservation treatment, and (3) have similar potential productivity. These groups and the interpretations for each are given in table 3. Table 3 is followed by table 4, which shows the potential productivity of upland oak, Virginia pine, shortleaf pine, and yellow-poplar growing in Adair County.

The interpretations that are made in table 3 for each woodland suitability group of soils include (1) the potential productivity of the soils for wood crops, (2) the preferred species to favor in existing woodland, (3) the preferred species for planting, (4) the hazard of gully erosion, (5) equipment limitations, (6) plant competition, and (7) seedling mortality. These interpretations can be helpful to owners of woodland in considering alternative uses of the soils, in selecting the kinds of trees that will produce the best wood crops, and in determining the feasibility of using various intensities of woodland management. Each of these seven items was explored and rated in relation to each kind of soil, according to the following guidelines.

The potential productivity was determined for the trees on about 250 woodland sites in Adair County and in other counties in Kentucky located in the same physiographic region. Each site was selected to represent a specific kind of wood crop growing on a recognized kind of soil. As nearly as feasible, measurements were confined to well-stocked, naturally occurring, even-aged, and unmanaged forest stands, not adversely affected by fire, livestock grazing, insects, or diseases. On each site, measurements were made of 4 to 10 healthy trees that have always been dominant or codominant in the stand. The total height and age of these trees were used to obtain site indexes that are considered to be good indicators of potential productivity. Site index refers to the average total height of the dominant stand at 50 years or some other specified age. Except for cottonwood, for which an age of 30 years is used, 50 years is used for all species.

Woodland sites suitable for measurement were not available on all the soils for one or more of the species for which measurements were desired. Where a suitable woodland site was not available, the site index values of similar soils were used.

TABLE 3.—*Woodland*

[Absence of a figure indicates that the specified tree is not

Woodland suitability group and description of soils	Potential productivity (site index)				
	Upland oak [1]	Virginia pine [1]	Shortleaf pine [1]	Yellow-poplar [1]	Red-cedar [1]
Group 1 Deep, well-drained soils of the uplands and terraces; predominantly of limestone origin, but in places they have been influenced by loess or by shale and sandstone. These soils have a silty surface layer and a moderately clayey subsoil; they are cherty in places. The soils are gently sloping to sloping and are uneroded to moderately eroded.	88±6	75	67	93±	41±4
Group 2 Deep, well-drained soils of the uplands and terraces; predominantly of limestone origin, but in places they have been influenced by loess or shale. The surface layer is silty, and the subsoil is moderately clayey. In places these soils are cherty. They are strongly sloping and are uneroded to moderately eroded.	88±6	75	67	93±3	41±4
Group 3 Moderately deep, somewhat excessively drained soils of the uplands; the soils are of very cherty limestone origin. Their surface layer is cherty and silty. Their subsoil is thin; it is very cherty, is silty to moderately clayey, and overlies chert beds. The soils are sloping to steep and have no significant erosion.	72±3			81	
Group 4 Moderately deep, well-drained, but slowly permeable, soils of the uplands. The origin of the soils was from shale and impure limestone. The surface layer is silty, and the subsoil is very plastic and clayey. These soils are gently sloping to sloping and are uneroded to moderately eroded.	67±6				

See footnotes at end of table.

The species selected for measurement were upland oaks (white, black, southern red, northern red, scarlet, and chestnut oaks), Virginia pine, shortleaf pine, yellow-poplar, redcedar, pin oak, sweetgum, and cottonwood. Height and age measurements were converted to the site indexes by applying the results of published research.[3]

To arrive at the production figures given in table 4, site index values for upland oak, Virginia pine, shortleaf pine, and yellow-poplar were related to published research studies (*9*, *14*, *15*, *16*). No production figures are available for redcedar.

The site index values of pin oak, sweetgum, and cottonwood growing on the poorly drained lowlands can be related to published research to estimate the approximate potential production of these kinds of trees under good management (*13*). Soils that have a site index of 100 or more for cottonwood have an average production potential of about 770 board feet per acre per year. This is based on several intermediate harvests and on a final harvest when the trees are 45 years old and have an average diameter of about 34 inches at breast height. Soils that have a site index of 90 or more for pin oak have an average production potential of about 520 board feet per acre per year. This is based on several intermediate harvests and a final harvest when the trees are 80 years old and have an average diameter of about 38 inches at breast height. Soils that have a site index of 90 or more for sweetgum have an average production potential of about 380 board feet per acre per year. This is based on several intermediate harvests and a final harvest when the trees are 96 years old and have an average diameter of about 34 inches at breast height.

The preferred species to favor in existing woodland are listed in order of their priority in table 3. Factors that combine to indicate the apparent priority are the site index, the quality of the trees, and the density of the development in natural stands. The preferred species are those that generally should be favored in woodland management operations, such as weeding and improvement cutting.

The preferred species for planting are also listed in table 3. Experience to date indicates that cottonwood is the best kind of tree to plant on open fields in the lowlands, and that pines are the best species to plant on open fields in the uplands.

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[3] The site index curves used for upland oak are from USDA TECHNICAL BULLETIN 560. (*14*). The curves used for Virginia pine are from N.C. STATE COLLEGE TECHNICAL BULLETIN 100 (*15*). The curves used for shortleaf pine are by COILE and SCHUMACHER, JOURNAL OF FORESTRY 51 (*4*). The curves used for yellow-poplar were constructed in 1957 by W. T. DOOLITTLE, U.S. Forest Service, and those for redcedar are based on observations of plots in 1948 by the Tennessee Valley Authority. The curves used for pin oak and sweetgum are sweetgum curves from SOUTHERN FOREST EXPERIMENT STATION OCCASIONAL PAPER 176 (*3*), and those for cottonwood are from SOUTHERN FOREST EXPERIMENT STATION OCCASIONAL PAPER 178 (*2*).

suitability groups of soils

grown on the soil or that its occurrence is not significant]

Species to favor—		Hazard of gully erosion	Equipment limitations	Plant competition	Seedling mortality
In existing woodlands	For planting				
Yellow-poplar, black walnut, black cherry, white oak.	Black locust, yellow-poplar, black walnut, white pine, shortleaf pine.	Slight to moderate.	Slight to moderate.	Severe	Slight.
Yellow-poplar, black walnut, black cherry, white oak.	Black locust, yellow-poplar, black walnut, white pine, shortleaf pine, loblolly pine.	Severe	Severe	Severe	Slight.
Black oak, southern red oak, hickory.	Loblolly pine, shortleaf pine, white pine.	Moderate to severe.	Moderate to severe.	Severe	Slight.
Black oak, southern red oak, hickory.	Loblolly pine, shortleaf pine, white pine, black locust.	Slight to moderate.	Slight to moderate.	Severe	Slight.

TABLE 3.—*Woodland suitability*

[Absence of a figure indicates that the specified tree is not

Woodland suitability group and description of soils	Potential productivity (site index)				
	Upland oak [1]	Virginia pine [1]	Shortleaf pine [1]	Yellow-poplar [1]	Red-cedar [1]
Group 5. Moderately deep, well-drained, but slowly permeable, soils of the uplands. The soils are of shale and impure limestone origin. They have a silty to moderately clayey surface layer and a very plastic, clayey subsoil. The soils are strongly sloping and are moderately eroded.	67±6				
Group 6. Severely eroded soils of the uplands. The soils have a moderately clayey layer and a plastic, clayey subsoil. They are sloping to steep.	60	72			37
Group 7. Severely eroded, rocky soils of the uplands. The soils have a clayey surface layer and a very plastic, clayey subsoil. They are sloping to steep.	51				37
Group 8. Shallow, somewhat excessively drained soils of the uplands. The soils are mainly of shaly limestone origin, but in places there is a thin mantle of loess or material similar to loess. These soils have a silty surface layer and a thin, silty or moderately clayey subsoil. They are gently sloping to sloping and are slightly to moderately eroded.	60±5	60±6	57		38±2
Group 9. Dominantly shallow, excessively drained soils of the uplands. The soils are of shale, limestone, or sandstone origin. They have a silty surface layer and a thin subsoil. The soils are dominantly moderately steep to steep and are slightly to moderately eroded.	60±5	60±6	57		38±2
Group 10. Moderately deep, moderately well drained soils of the uplands. The origin of the soils was very cherty limestone or low-grade limestone with some influence from loess. Their surface layer and subsoil are silty, and a fragipan occurs at a depth of 18 to 26 inches. These soils are nearly level to gently sloping and have little or no erosion.	80±7			94±7	
Group 11. Deep, well-drained to somewhat excessively drained, medium- to light-textured soils of the flood plains or low-lying terraces. The soils are nearly level and have no significant erosion.	75±2			96±7	
Group 12. Deep, well-drained, cherty, medium-textured soils of the foot slopes. The soils are of low-grade limestone origin. They are gently sloping to moderately steep and are slightly to moderately eroded.	75±2			96±7	
Group 13. Moderately deep, moderately well drained soils of the terraces. The soils are of limestone origin. Their surface layer and subsoil are silty, and a fragipan occurs at a depth of 18 to 24 inches. These soils are nearly level to strongly sloping and are uneroded to moderately eroded.	75			89	41
Group 14. Nearly level, somewhat poorly drained, silty soil of the uplands and terraces. This soil is of limestone origin. It has a fragipan near the surface.	69±6			85±7	39
	Pin oak [2]	Sweetgum [2]	Cottonwood [2]		
Group 15. Nearly level, somewhat poorly drained or poorly drained, silty or moderately clayey soils of the flood plains and terraces; subject to overflow that remains on the areas for long periods.	96±7	91±6	100±5		

[1] Site index at 50 years.

groups of soils—Continued

grown on the soil or that its occurrence is not significant]

Species to favor—		Hazard of gully erosion	Equipment limitations	Plant competition	Seedling mortality
In existing woodlands	For planting				
Black oak, southern red oak, hickory, redcedar.	Loblolly pine, shortleaf pine, white pine.	Severe	Severe	Severe	Slight.
Virginia pine, black oak, redcedar, southern red oak.	Loblolly pine, shortleaf pine	Severe	Severe	Slight	Severe.
Redcedar	Redcedar	Severe	Severe	Slight	Severe.
Black oak, southern red oak, white oak, hickory.	Loblolly pine, shortleaf pine	Slight	Slight to moderate.	Moderate	Moderate.
Black oak, southern red oak, redcedar.	Loblolly pine, shortleaf pine	Severe	Severe	Moderate	Moderate.
Yellow-poplar, ash, white oak, black oak.	Black locust, white pine, loblolly pine, shortleaf pine.	Slight	Slight	Severe	Slight.
Yellow-poplar, black walnut, black cherry, white oak.	Yellow-poplar, black walnut, black locust, white pine, loblolly pine, shortleaf pine.	Slight	Slight	Severe	Slight.
Yellow-poplar, black walnut, black cherry, white oak, sweetgum.	Yellow-poplar, black walnut, black locust, white pine, loblolly pine, shortleaf pine.	Severe	Moderate to severe.	Severe	Slight.
White oak, yellow-poplar	White pine, loblolly pine, shortleaf pine, black locust.	Slight to moderate.	Slight	Severe	Slight.
Black oak, southern red oak, ash, red maple, yellow-poplar.	Black locust, white pine, loblolly pine.	Slight	Moderate	Severe	Slight.
Cottonwood, pin oak, sweetgum	Cottonwood, sweetgum, baldcypress	Slight	Severe	Severe	Slight.

[2] Site index at 30 years.

The hazard of gully erosion is intended to indicate the hazard that exists on soils where gully erosion may be caused by woodland management operations. It is assumed that the woodlands are satisfactorily protected from fire and livestock and that damage from fire or livestock has not contributed to the rating. The dominant factors that influence the development of gullies are steepness of slope, length of slope, and characteristics of the soils. Woodland management operations that help control the development of gullies are the proper construction, location, and maintenance of roads and skid trails. The steepness of slope is the major factor in rating the hazard of gully erosion. Generally, the hazard is rated *slight* on slopes of 0 to 6 percent, *moderate* on slopes of 6 to 12 percent, and *severe* on slopes steeper than 12 percent. These general rules are modified when the factors of slope length and soil characteristics, or both, emphasize or minimize the factor of slope.

The ratings for equipment limitations assume the use of mechanical equipment that is available normally for woodland operations. The dominant factors that limit the use of equipment are steepness of slope, wetness of the soil, rough terrain, and obstacles, such as rocks. Generally, the limitations are rated *slight* for the slopes of 0 to 6 percent where farm-type vehicles can operate efficiently without the construction and maintenance of permanent roads and skid trails. The rating is *moderate* on slopes of 6 to 12 percent where the operation of farm-type equipment is less efficient than on more gentle slopes. The rating is *severe* on slopes greater than 12 percent where track-type equipment is necessary for efficient harvesting operations. Periods of seasonal wetness that average about 2 months per year in length give a soil a rating of *moderate*. Wet periods of 3 or more months annually give a soil a rating of *severe*. Such periods prevent the use of conventional wheel- or track-type equipment.

The rating for plant competition reflects the degree to which plants invade a woodland area, following the removal of the tree canopy. It also reflects the degree to which plants compete to the detriment of regeneration and growth of desirable, naturally occurring species or to the detriment of newly planted trees. Where this problem is unimportant, the rating is *slight*. The rating is *severe* where special attention to weeding operations is necessary to obtain a stand of desirable trees. These ratings also indicate the limitations of successful tree planting on the different soils where plant competition is considered. The dominant factors that influence plant competition are those characteristics of the soils and topography that affect the availability of moisture in the soils during the growing season.

The rating for seedling mortality refers to the expected degree of mortality of naturally occurring or planted tree seedlings as influenced by the kinds of soils when plant competition is not a factor. The ratings are based primarily on the reaction of newly germinated seedlings and newly planted trees to the periods of drought that last for 2 to 3 weeks and that occur frequently during the early part of the growing season. The rating is *slight* where satisfactory stands are expected to survive. It is *moderate* where occasional replanting is needed and *severe* where new stands are largely destroyed because of seedling mortality.

TABLE 4.—*Approximate average yearly growth per acre for well-stocked, unthinned, naturally occurring stands of upland oak, Virginia pine, shortleaf pine, and yellow-poplar*

[The absence of figures indicates that these species are not generally grown on the soils of these groups]

Woodland suitability group	Upland oak [1]		Virginia pine [2]		Shortleaf pine [3]		Yellow-poplar [4]	
	Bd. ft.[5]	Cords [6]	Bd. ft.[5]	Cords [6]	Bd. ft.[5]	Cords [6]	Bd. ft.[5]	Cords [6]
1, 2	350	0.9	480	1.2	460	1.3	590	1.6
3	225	.6					400	1.2
4, 5	175	.5						
6	150	.1	460	1.2				
7	85	.2						
8, 9	150	.4	370	1.0	325	1.0		
10	280	.7					600	1.6
11, 12	240	.6					625	1.7
13	240	.6					525	1.5
14	275	.6					460	1.3

[1] Adapted from USDA Technical Bulletin 560 (*14*).
[2] Adapted from N.C. State College Technical Bulletin 100 (*15*).
[3] Adapted from USDA Miscellaneous Publication 50 (*16*).
[4] Adapted from an unpublished manuscript by E. F. McCarthy.
[5] Trees 60 years of age measured according to international ¼-inch rule.
[6] Trees 35 years of age; yield measured in rough cords.

WOODLAND SUITABILITY GROUP 1

This group consists of deep, well-drained soils of the uplands and stream terraces. The soils are predominantly of limestone origin, but in places they have been influenced by loess or by shale and sandstone. The soils are cherty in places and have a silty surface layer and a moderately clayey subsoil. They are gently sloping to sloping and are uneroded to moderately eroded. The following soils are in this group:

BaB	Baxter cherty silt loam, 2 to 6 percent slopes.
BaC	Baxter cherty silt loam, 6 to 12 percent slopes.
BaC2	Baxter cherty silt loam, 6 to12 percent slopes.
BeB	Bewleyville silt loam, 2 to 6 percent slopes.
BeC	Bewleyville silt loam, 6 to 12 percent slopes.
BeC2	Bewleyville silt loam, 6 to 12 percent slopes, eroded.
CfC2	Christian fine sandy loam, 6 to 12 percent slopes, eroded.
ChB	Christian silt loam, 2 to 6 percent slopes.
ChC	Christian silt loam, 6 to 12 percent slopes.
ChC2	Christian silt loam, 6 to 12 percent slopes, eroded.
CsC2	Christian-Baxter cherty loams, 6 to 12 percent slopes, eroded.
CvC2	Cookeville silt loam, 6 to 12 percent slopes, eroded.
EtB	Etowah silt loam, 2 to 6 percent slopes.
EtC	Etowah silt loam, 6 to 12 percent slopes.
FtB	Frankstown cherty silt loam, 2 to 6 percent slopes.
FtC	Frankstown cherty silt loam, 6 to 12 percent slopes.
FtC2	Frankstown cherty silt loam, 6 to 12 percent slopes, eroded.
MoB	Mountview silt loam, 2 to 6 percent slopes.
MoC	Mountview silt loam, 6 to 12 percent slopes.
MoC2	Mountview silt loam, 6 to 12 percent slopes, eroded.
PmB	Pembroke silt loam, 2 to 6 percent slopes.
PmC	Pembroke silt loam, 6 to 12 percent slopes.

The potential productivity of these soils is high, and intensive management is justified.

The hazard of gully erosion is moderate in areas where the slope is more than 6 percent. In those areas some

attention needs to be given to the proper location, construction, and maintenance of roads and skid trails.

Equipment limitations are moderate on slopes of more than 6 percent. In harvesting operations the use of farm-type equipment is somewhat limited.

Plant competition is severe on these soils, mainly because of the favorable amount of moisture in the soils during the growing season. Low-quality trees that tolerate shade generally become established in the understory of saw-log stands. When the canopy is removed by logging, these shade-tolerant trees usually prevent desirable kinds of trees from becoming established. One or more weeding operations are frequently required to assure the dominance of trees that will produce a desirable wood crop. Interplanting or conversion planting normally is not feasible, because of the intensive weeding requirements. Competition to newly planted trees is severe on open land that has been abandoned for more than 2 years after use for crops or pasture.

WOODLAND SUITABILITY GROUP 2

This group consists of deep, well-drained soils of the uplands and stream terraces. The soils have a silty surface layer and a moderately clayey subsoil. In places they are cherty. They are strongly sloping and are uneroded to moderately eroded. The following soils are in this group:

BaD	Baxter cherty silt loam, 12 to 20 percent slopes.
BaD2	Baxter cherty silt loam, 12 to 20 percent slopes, eroded.
BaE2	Baxter cherty silt loam, 20 to 30 percent slopes, eroded.
CaE2	Caneyville very rocky soils, 20 to 30 percent slopes, eroded.
CaF2	Caneyville very rocky soils, 30 to 45 percent slopes, eroded.
CfD2	Christian fine sandy loam, 12 to 20 percent slopes, eroded.
ChD	Christian silt loam, 12 to 20 percent slopes.
ChD2	Christian silt loam, 12 to 20 percent slopes, eroded.
CrD2	Christian very rocky soils, 8 to 20 percent slopes, eroded.
CsD2	Christian-Baxter cherty loams, 12 to 20 percent slopes, eroded.
CsE2	Christian-Baxter cherty loams, 20 to 30 percent slopes, eroded.
FtD	Frankstown cherty silt loam, 12 to 20 percent slopes.
FtD2	Frankstown cherty silt loam, 12 to 20 percent slopes, eroded.

The potential productivity of these soils is high, and intensive management is therefore justified.

The hazard of gully erosion is severe, mainly because of the steep slope. Equipment limitations are severe, and track-type equipment is needed so that harvesting can be done efficiently.

Plant competition is severe, mainly because of the favorable amount of moisture in the soils during the growing season. Low-quality trees that tolerate shade generally become established in the understory of saw-log stands. When the canopy is removed by logging, these shade-tolerant trees usually prevent desirable kinds of trees from becoming established. One or more weeding operations are frequently required to assure the dominance of trees that are desirable for wood crops. Interplanting or conversion planting generally is not feasible, because of the intensive weeding requirements. Competition to newly planted trees is severe on open land that has been abandoned for more than 2 years after use for crops or pasture.

WOODLAND SUITABILITY GROUP 3

This group consists of moderately deep, somewhat excessively drained soils of the uplands. These soils formed in material from very cherty limestone. Their surface layer is cherty and silty, and their subsoil is thin, very cherty, and silty to moderately clayey. Their subsoil overlies beds of chert. The soils are sloping to steep and have no significant erosion. The following soils are in this group:

BoC	Bodine cherty silt loam, 6 to 12 percent slopes.
BoD	Bodine cherty silt loam, 12 to 20 percent slopes.
BoE	Bodine cherty silt loam, 20 to 30 percent slopes.
BoF	Bodine cherty silt loam, 30 to 50 percent slopes.

The potential productivity is moderately high for oak and fair for yellow-poplar. Moderately intensive management is justified.

The hazard of gully erosion is moderate on slopes of less than 12 percent. On slopes of more than 12 percent, the hazard of gully erosion is severe and special attention needs to be given to the proper location, construction, and maintenance of roads and skid trails.

Equipment limitations are moderate on slopes of less than 12 percent, where the use of farm-type vehicles is somewhat restricted. Equipment limitations are severe on slopes of more than 12 percent, where track-type equipment is needed for efficient harvesting operations.

Plant competition is severe, mainly because of the favorable amount of moisture in the soils during the growing season. Low-quality trees that tolerate shade generally become established in the understory of saw-log stands. When the canopy is removed by logging, these shade-tolerant trees normally prevent desirable kinds of trees from becoming established. One or more weeding operations are frequently required to assure the dominance of trees that are desirable for wood crops. Interplanting or conversion planting is generally not feasible, because of intensive weeding requirements. Competition to newly planted trees is severe on open land that has been abandoned for more than 2 years after use as cropland or pasture.

WOODLAND SUITABILITY GROUP 4

This group consists of soils that are moderately deep and well drained, but that are slowly permeable. The soils are on uplands. They formed in material from shale and impure limestone. Their surface layer is silty, and their subsoil is very plastic and clayey. The soils are gently sloping to sloping and are uneroded to moderately eroded. The following soils are in this group:

NdB	Needmore silt loam, 2 to 6 percent slopes.
NdC	Needmore silt loam, 6 to 12 percent slopes.
NfB2	Needmore silty clay loam, 2 to 6 percent slopes, eroded.
NfC2	Needmore silty clay loam, 6 to 12 percent slopes, eroded.
TbC2	Talbott silt loam, 6 to 12 percent slopes, eroded.

The potential productivity is fair, so only moderately intensive management is justified.

The hazard of gully erosion is moderate on slopes of more than 6 percent. Some attention should be given to the proper location, construction, and maintenance of roads and skid trails.

Equipment limitations are moderate on slopes of more than 6 percent. In harvesting operations the use of farm-type equipment is somewhat limited.

Plant competition is severe, mainly because of the favorable amount of moisture in the soils during the growing season. Low-quality trees that tolerate shade usually become established in the understory of saw-log stands. When the canopy is removed by logging, these shade-tolerant trees usually prevent desirable kinds of trees from becoming established. One or more weeding operations are frequently required to assure the dominance of trees that are desirable for wood crops. Interplanting or conversion planting is generally not feasible, because of the intensive weeding requirements. Competition to newly planted trees is severe on open land that has been abandoned for more than 2 years after use as cropland or pasture.

WOODLAND SUITABILITY GROUP 5

The soils in this group are moderately deep and well drained, but they are slowly permeable. They formed in material from shale and impure limestone. These soils have a silty to moderately clayey surface layer and a very plastic, clayey subsoil. They are strongly sloping and are moderately eroded. The following soils are in this group:

- NfD2 Needmore silty clay loam, 12 to 20 percent slopes, eroded.
- TrD2 Talbott very rocky silt loam, 12 to 20 percent slopes, eroded.
- TrE2 Talbott very rocky silt loam, 20 to 30 percent slopes, eroded.

The potential productivity is fair and justifies only moderately intensive management.

The hazard of gully erosion is severe, mainly because of the steep slope. Special attention needs to be given to the proper location, construction, and maintenance of roads and skid trails.

Equipment limitations are severe, mainly because of the steep slope. Track-type equipment is needed for efficient harvesting operations.

Plant competition is severe because of the favorable amount of moisture in the soils during the growing season. Low-grade trees that tolerate shade usually become established in the understory of saw-log stands. When the canopy is removed by logging, these shade-tolerant trees generally prevent trees that are desirable for wood crops from becoming established. Interplanting or conversion planting generally is not feasible, because of the intensive weeding requirements. Competition to newly planted trees is severe on open land that has been abandoned for more than 2 years after use for crops or pasture.

WOODLAND SUITABILITY GROUP 6

This group consists of sloping to steep, severely eroded soils of the uplands. These soils have a moderately clayey surface layer and a plastic, clayey subsoil. The following soils are in this group:

- BcD3 Baxter cherty silty clay loam, 12 to 20 percent slopes, severely eroded.
- BcE3 Baxter cherty silty clay loam, 20 to 30 percent slopes, severely eroded.
- CmC3 Christian silty clay loam, 6 to 12 percent slopes, severely eroded.
- CmD3 Christian silty clay loam, 12 to 20 percent slopes, severely eroded.
- CsE3 Christian-Baxter cherty loams, 20 to 30 percent slopes, severely eroded.
- CrD3 Christian very rocky soils, 12 to 20 percent slopes, severely eroded.
- Gn Gullied land.
- WmE3 Westmoreland shaly silty clay loam, 12 to 30 percent slopes, severely eroded.
- WmF3 Westmoreland shaly silty clay loam, 30 to 50 percent slopes, severely eroded.

The potential productivity is fair for oak and moderately high for Virginia pine. Moderately intensive management is justified.

The hazard of gully erosion is dominantly severe because of the steep slopes and the presence of channels that receive concentrated runoff. Special attention needs to be given to the proper location, construction, and maintenance of roads and skid trails.

Equipment limitations are severe because of the steep, rough slope and the rocks, which are obstacles. Track-type equipment and power winches are needed for efficient harvesting operations.

Seedling mortality is severe because the amount of moisture in the soils is unfavorable during the growing season. Short periods of drought, 2 to 3 weeks long, that frequently occur early in the growing season cause severe losses in newly germinated seedlings or newly planted trees.

WOODLAND SUITABILITY GROUP 7

This group consists of severely eroded, rocky soils of the uplands. These soils are sloping to steep. They have a clayey surface layer and a very plastic, clayey subsoil. The following soils are in this group:

- CaE3 Caneyville very rocky soils, 20 to 30 percent slopes, severely eroded.
- CaF3 Caneyville very rocky soils, 30 to 45 percent slopes, severely eroded.
- NeD3 Needmore silty clay, 8 to 20 percent slopes, severely eroded.
- Rk Rock land.
- TvD3 Talbott very rocky silty clay, 12 to 20 percent slopes, severely eroded.
- TvE3 Talbott very rocky silty clay, 20 to 30 percent slopes, severely eroded.

The potential productivity is fair for redcedar and low for all other species. Generally, only a low intensity of management is justified.

The hazard of gully erosion is dominantly severe because of the steep slope and presence of channels that receive concentrated runoff. Special attention needs to be given to the proper location, construction, and maintenance of roads and skid trails.

Equipment limitations are severe, mainly because of the steep, rough slopes and the rocks, which are obstacles. Generally, track-type equipment is needed for efficient harvesting operations.

Seedling mortality is severe because the amount of moisture in the soils is unfavorable during the growing season. Short periods of drought, 2 to 3 weeks long, that frequently occur early in the growing season cause severe losses of newly germinated seedlings or of newly planted trees.

WOODLAND SUITABILITY GROUP 8

This group consists of shallow, somewhat excessively drained soils of the uplands. The soils formed in material

from shaly limestone. They have a silty surface layer and a thin, silty or moderately clayey subsoil. In places there is a thin mantle of loess or of material similar to loess. The soils are gently sloping to sloping and are slightly to moderately eroded. The following soils are in this group:

MsB	Mountview silt loam, shallow, 2 to 6 percent slopes.
MsC	Mountview silt loam, shallow, 6 to 12 percent slopes.
MsC2	Mountview silt loam, shallow, 6 to 12 percent slopes, eroded.
WeB	Westmoreland shaly silt loam, 2 to 6 percent slopes.
WeC	Westmoreland shaly silt loam, 6 to 12 percent slopes.

The potential productivity is fair, so only moderately intensive management is justified.

Plant competition is only moderate because the moisture in the soils is somewhat unfavorable during the growing season. Low-quality trees that tolerate shade tend to become established in the understory of saw-log stands. When the overstory is removed by logging, these shade-tolerant trees often prevent an adequate stand of desirable kinds of trees from becoming established. Some attention needs to be given to weeding operations to assure the dominance of desirable kinds of trees or of newly planted trees. Moderate competition to newly planted trees can be expected on open land that has been abandoned for more than 3 years after use as cropland or pasture.

Seedling mortality is moderate because the moisture in the soils is somewhat unfavorable during the growing season. Periods of drought, 2 to 3 weeks long, frequently occur early in the growing season and cause moderate losses of newly germinated seedlings or of newly planted trees.

WOODLAND SUITABILITY GROUP 9

This group consists mainly of shallow, excessively drained soils of the uplands. These soils are of shale, limestone, or sandstone origin. They have a silty surface layer and a thin subsoil. The soils are dominantly moderately steep to steep and are slightly to moderately eroded. The following soils are in this group:

CtE	Colyer shaly silt loam, 12 to 30 percent slopes.
HeD2	Humphreys cherty silt loam, shallow, 12 to 20 percent slopes, eroded.
MsD	Mountview silt loam, shallow, 12 to 20 percent slopes.
MsD2	Mountview silt loam, shallow, 12 to 20 percent slopes, eroded.
MuE	Muskingum very fine sandy loam, 18 to 30 percent slopes.
RcD	Rockcastle silt loam, 12 to 20 percent slopes.
RcE	Rockcastle silt loam, 20 to 30 percent slopes.
RcF	Rockcastle silt loam, 30 to 40 percent slopes.
WeD	Westmoreland shaly silt loam, 12 to 20 percent slopes.
WeE	Westmoreland shaly silt loam, 20 to 30 percent slopes.
WeF	Westmoreland shaly silt loam, 30 to 55 percent slopes.

The potential productivity is fair, so only moderately intensive management is justified.

The hazard of gully erosion is severe, mainly because of the steep slope. Special attention needs to be given to the proper location, construction, and maintenance of roads and skid trails.

Equipment limitations are severe, mainly because of the steep slope. Track-type equipment is needed for efficient harvesting operations.

Plant competition is moderate because of the somewhat unfavorable soil-moisture relationships during the growing season. Low-quality trees that tolerate shade tend to become established in the understory of saw-log stands. When the overstory is removed by logging, these shade-tolerant trees often prevent desirable kinds of trees from becoming established. Some attention needs to be given to weeding operations to assure the dominance of desirable natural regeneration or of newly planted trees. Moderate competition to newly planted trees can be expected on open land that has been abandoned for more than 3 years after use as cropland or pasture.

Seedling mortality is moderate because of the somewhat unfavorable soil-moisture relationship during the growing season. Periods of drought, 2 to 3 weeks long, that frequently occur early in the growing season cause moderate losses of newly germinated seedlings or of newly planted trees.

WOODLAND SUITABILITY GROUP 10

This group consists of moderately deep, moderately well drained soils of the uplands. These soils formed predominantly in material from very cherty limestone or low-grade limestone, but they may have been influenced by loess. The surface layer and the subsoil are silty. A fragipan occurs at a depth of 18 to 26 inches. These soils are nearly level to gently sloping and have little or no erosion. The following soils are in this group:

DcB	Dickson silt loam, 2 to 6 percent slopes.
SaA	Sango silt loam, 0 to 2 percent slopes.
SaB	Sango silt loam, 2 to 6 percent slopes.

The potential productivity is high, and intensive management is justified.

Plant competition is severe because the amount of moisture in the soils is favorable during the growing season. Low-quality trees that tolerate shade usually become established in the understory of saw-log stands. When the canopy is removed by logging, these shade-tolerant trees generally prevent desirable kinds of trees from becoming established. One or more weeding operations are frequently required to assure the dominance of desirable trees suitable for a wood crop. Interplanting or conversion planting generally is not feasible, because of intensive weeding requirements. Competition to newly planted trees is severe on open land that has been abandoned for use as cropland or pasture for more than 2 years.

WOODLAND SUITABILITY GROUP 11

This group consists of deep, well-drained to somewhat excessively drained, medium-textured to light-textured soils of the flood plains or low stream terraces. These soils are nearly level and have no significant erosion. The following soils are in this group:

Br	Bruno loamy fine sand.
Hf	Huntington fine sandy loam.
Hg	Huntington gravelly loam.
Hu	Huntington silt loam.
Ls	Lindside silt loam.
SeB	Sequatchie silt loam, 0 to 4 percent slopes.
Sg	Staser gravelly loam.
Sm	Staser loam.
St	Staser silt loam.
Wt	Whitwell silt loam.
Wv	Wolftever silt loam.

The potential productivity is high, and it justifies intensive management.

Plant competition is severe because the amount of moisture in the soils is favorable during the growing season. Low-quality trees that tolerate shade usually become established in the understory of saw-log stands. When the canopy is removed by logging, these shade-tolerant trees usually prevent desirable kinds of trees from becoming established. One or more weeding operations are frequently required to assure the dominance of trees suitable for wood crops. Interplanting or conversion planting generally is not feasible, because of intensive weeding requirements. Competition to newly planted trees is severe on open land that has been abandoned for more than 2 years after use as cropland or pasture.

WOODLAND SUITABILITY GROUP 12

This group consists of deep, well-drained, cherty, medium-textured soils of the foot slopes. Their parent material was derived mostly from weathered, impure limestone. They are gently sloping to moderately steep and are slightly to moderately eroded. The following soils are in this group:

HcB	Humphreys cherty silt loam, 2 to 6 percent slopes.
HcC	Humphreys cherty silt loam, 6 to 12 percent slopes.
HcC2	Humphreys cherty silt loam, 6 to 12 percent slopes, eroded.
HcD2	Humphreys cherty silt loam, 12 to 20 percent slopes, eroded.
HcE	Humphreys cherty silt loam, 20 to 30 percent slopes.
HcE2	Humphreys cherty silt loam, 20 to 30 percent slopes, eroded.
HdC	Humphreys silt loam, 6 to 12 percent slopes.

The potential productivity is high and justifies intensive management.

The hazard of gully erosion is severe, mainly because of the position of the soils on foot slopes, where they receive runoff from the soils above them.

Equipment limitations are moderate on slopes of less than 12 percent, where the use of farm-type equipment is somewhat limited in harvesting operations. Equipment limitations are severe on slopes of more than 12 percent, where track-type equipment is needed for efficient harvesting operations.

Plant competition is severe because of the favorable amount of moisture in the soils during the growing season. Low-quality trees that tolerate shade usually become established in the understory of saw-log stands. When the canopy is removed by logging, these shade-tolerant trees usually prevent trees that are desirable for a wood crop from becoming established. Interplanting or conversion planting generally is not feasible, because of the intensive weeding requirements. Competition to newly planted trees is severe on open land that has been abandoned for more than 2 years after use as cropland or pasture.

WOODLAND SUITABILITY GROUP 13

This group consists of moderately deep, moderately well drained soils of the stream terraces. The soils formed in material from limestone. Their surface layer and subsoil are silty, and a fragipan is at a depth of 18 to 24 inches. These soils are nearly level to strongly sloping and are uneroded to moderately eroded. The following soils are in this group:

CbB	Captina silt loam, 2 to 6 percent slopes.
LaA	Landisburg cherty silt loam, 0 to 2 percent slopes.
LaB	Landisburg cherty silt loam, 2 to 6 percent slopes.
LdA	Landisburg silt loam, 0 to 2 percent slopes.
LdB	Landisburg silt loam, 2 to 6 percent slopes.
LdC	Landisburg silt loam, 6 to 12 percent slopes.
LdC2	Landisburg silt loam, 6 to 12 percent slopes, eroded.
LaC	Landisburg cherty silt loam, 6 to 12 percent slopes.
LaC2	Landisburg cherty silt loam, 6 to 12 percent slopes eroded.
LaD2	Landisburg cherty silt loam, 12 to 20 percent slopes, eroded.

The potential productivity is moderately high; it justifies intensive management.

Plant competition is severe, mainly because of the favorable amount of moisture in the soils during the growing season. Low-quality trees that tolerate shade usually become established in the understory of saw-log stands. When the canopy is removed by logging, these shade-tolerant trees usually prevent desirable kinds of trees from becoming established. One or more weeding operations are frequently required to assure the dominance of a desirable wood crop. Interplanting or conversion planting generally is not feasible, because of the intensive weeding requirements. Competition to newly planted trees is severe on open land that has been abandoned for more than 2 years after use as cropland or pasture.

WOODLAND SUITABILITY GROUP 14

Only one soil—Lawrence silt loam (Lr)—is in this group. This silty soil is nearly level and is somewhat poorly drained. It is on the uplands and stream terraces and is of limestone origin. A fragipan is near the surface.

The potential productivity is fair; it justifies only moderately intensive management.

Equipment limitations are moderate because of periods of wetness. Generally, these periods last about 2 months of each year.

Plant competition is severe because of the abundant amount of available moisture in the soil during the growing season. Low-quality trees that tolerate shade usually become established in the understory of saw-log stands. When the canopy is removed by logging, these shade-tolerant trees usually prevent desirable kinds of trees from becoming established. One or more weeding operations are frequently required to assure the dominance of a desirable wood crop. Interplanting or conversion planting generally is not feasible, because of intensive weeding requirements. Competition to newly planted trees is severe on open land that has been abandoned for more than 2 years after use as cropland or pasture.

WOODLAND SUITABILITY GROUP 15

The soils in this group are nearly level, somewhat poorly drained or poorly drained, and silty or moderately clayey. They are on flood plains and stream terraces and are subject to overflow. The floodwaters remain for long periods. These soils are suited to pin oak, sweetgum, and cottonwood, rather than to upland oak, Virginia and shortleaf pines, yellow-poplar, and redcedar. The following soils are in this group:

Du	Dunning silt loam.
Gu	Guthrie silt loam.
Me	Melvin silt loam.
Ng	Newark gravelly silt loam.
Nk	Newark silt loam.
Rb	Robertsville silt loam.
Ta	Taft silt loam.

The potential productivity is high, so intensive management is justified.

Equipment limitations are severe because of periods of seasonal wetness that last for a total of 3 months each year.

Plant competition is severe because of the abundant available moisture in the soils during the growing season. Low-quality trees that tolerate shade usually become established in the understory of saw-log stands. When the canopy is removed by logging, these shade-tolerant trees usually prevent the desirable kinds of trees from becoming established. One or more weeding operations are frequently required to assure the dominance of a desirable wood crop. Interplanting or conversion planting generally is not feasible, because of intensive weeding requirements. Competition to newly planted trees is severe on open land that has been abandoned for more than 2 years after use as cropland or pasture.

Use of the Soils for Wildlife

This section tells about the kinds of wildlife in the county and their requirements for a habitat. It also describes the soils according to their ability to support vegetation that will provide food and cover for wildlife.

Wildlife resources and requirements for habitats

The principal species of wildlife in Adair County are bobwhite quail, cottontail rabbit, gray squirrel, fox squirrel, mourning dove, several kinds of ducks, geese, ruffed grouse, white-tailed deer, skunk, opossum, raccoon, mink, muskrat, and red and gray fox. There are also many songbirds and nongame mammals in the county.

The streams of the county contain both rough and game fish. Carp and bullheads are examples of rough fish. Largemouth bass and small sunfish, such as the bluegill, are generally considered game fish. Most of the farm ponds have been stocked with game fish by the Kentucky Department of Fish and Wildlife Resources.

Bobwhite quail are found throughout the county, but the largest populations are on the Westmoreland-Caneyville-Baxter and the Frankstown-Bodine-Westmoreland soil associations. The average density is about 1½ coveys per 100 acres.

Quail thrive best in agricultural areas where each farm contains a woodlot and areas used for pasture, as well as areas used for field crops. To attract quail, all fields should be small—not more than 10 acres—and they should be separated by wide, brushy fence rows. The birds require grass for nesting, and they require seed-bearing plants, including cultivated crops, for food. They also need brush and trees for protection from weather and natural enemies. Bobwhite quail generally do not need open water for drinking, except possibly during periods of extreme drought. Normally, they obtain enough moisture from insects, berries, and fleshy fruits, which they eat in season.

Cottontail rabbits are distributed fairly evenly throughout the county. Their population probably ranges from about 25 animals per 100 acres to as many as 50.

Like quail, rabbits reach their greatest abundance in agricultural areas. They are vegetarians and eat such a wide variety of plants that food is seldom a problem. Cover, however, is a problem; the proverbial brier patch offers the best protection for rabbits. Farms that have fields used for crops as well as fields used for pasture, and that have cultivated fields separated from the pastures by wide, brushy fence rows, are the most productive of rabbits. Abandoned groundhog burrows are used for shelter during periods of severe cold.

Gray squirrels are found throughout the county where the habitat is suitable. They are more numerous than fox squirrels. Population estimates rate gray squirrels as abundant and fox squirrels as common in this county.

Gray squirrels prefer large, unbroken expanses of hardwood forests for their home. Forests that have a large amount of mature or decayed hardwoods contain the most squirrels because these trees furnish hollows that the animals use for dens. Nuts and fleshy fruits provide the bulk of the food for squirrels. The population of these animals fluctuates greatly in response to the production of the trees that furnish nuts. Among the trees that are important producers of food for squirrels are shagbark hickory, white oak, black oak, walnut, hackberry, sassafras, dogwood, and blackgum. Gray squirrels are also fond of mulberry and Osage-orange.

Fox squirrels generally live within the boundaries of the Staser-Taft-Landisburg association. For some reason, not clearly understood, fox squirrels seem to be more closely associated with bottom lands and areas near streams than do gray squirrels.

The fox squirrel prefers small farm woodlots in which there are openings, to the denser forests inhabited by the gray squirrel. The need for trees that provide food and dens is the same as that for the gray squirrel. The kinds of trees needed are also the same.

Mourning doves are most plentiful in areas of the Baxter-Christian-Bewleyville soil association. In these areas doves are so abundant that hunters have little trouble in filling the daily bag limit of 12 birds.

The mourning dove is migratory, but some of them remain in the county throughout the winter. These birds eat seeds and therefore are attracted to areas where grain crops are grown. They require open water for drinking, partly because they do not eat insects, and farm ponds are an important source of drinking water. Most doves nest in trees that have fairly open foliage, such as pine or elm, but some nest on the ground. Pine plantations or evergreens planted as ornamentals in urban cemeteries and parks are preferred nesting sites.

With the possible exception of the wood duck, *waterfowl* do not nest in Adair County. Several species of duck appear in the county during the migrating periods. The ducks concentrate along the Green River and Russell Creek where the soils are those of the Staser-Taft-Landisburg association. They are common during the migrating period, but their presence is influenced greatly by the extent to which the feeding areas on the bottom lands are flooded. Geese are rare, but when present, they are found on the same soil association as that used by ducks.

Foods preferred by ducks are millet, corn, smartweeds, soybeans, and small acorns, especially those of the pin oak. Ducks sometimes feed in a dry cornfield, but flooding to a depth of from 1 inch to as much as 12 inches is necessary to make the food properly available to ducks.

Ducks therefore concentrate on areas of bottom land where food is present and where periodic flooding occurs. Geese also eat grain, but flooding is not necessary to make the food available. Geese will feed in a dry cornfield. They also graze in areas where there is grass or other green plants, and they are especially fond of winter wheat and ladino clover.

Ruffed grouse are rare in this county. They are seen only occasionally, but when found, they are most likely to be on areas of the Westmoreland-Caneyville-Baxter soil association in the southwestern part of the county.

Ruffed grouse are birds of the forest. Within the forest, however, they are attracted to natural or manmade openings, where the preferred food plants grow. Among the preferred food plants are blackberry, wild cherry, flowering dogwood, and an occasional domesticated apple tree. Ruffed grouse also eat insects and acorns. In winter, when other food is scarce, they feed almost exclusively upon the buds of woody plants. Drumming logs are a requirement of a good habitat for grouse because it is on these that the males perform their courtship display. An old log that is decaying and that is more than 20 inches in diameter seems to be preferred.

White-tailed deer are rare in this county, but the Kentucky Department of Fish and Wildlife Resources has undertaken a restocking program that has met with marked success. At present, the largest population is found on the Frankstown-Bodine-Westmoreland and Sango-Mountview-Lawrence soil associations.

Deer are ordinarily considered to be forest animals, but they thrive in agricultural areas where there is a fairly large acreage of woodland interspersed with areas used for crops and pasture. Deer browse more than they graze, but their feeding habits change with the season. In spring they eat tender grass and clover. They eat the leaves of shrubs, trees, and herbs in summer, and acorns in fall. In winter they eat the tender twigs of shrubs and trees. Deer are also fond of ear corn. They require open water for drinking, especially during dry periods.

Skunks live mainly in agricultural areas that contain a well-balanced mixture of woodland, brushland, and grassland. The skunk seldom strays farther than a couple of miles from water. Its den is usually a hole in the ground, but old buildings sometimes serve as temporary shelter. Its food consists of insects, grubs, mice, eggs, and various fruits and berries.

Opossums are abundant, and they are evenly distributed throughout the county. Although opossums are commonly found in areas used for farming, they are primarily woodland animals. Sometimes opossums make their dens in an abandoned groundhog burrow, or they may make it under a brushpile, in an old building, or in a hollow tree. Their food consists of fruits, particularly persimmons, and insects, mice, garbage, and carrion. Sufficient water is a requirement of a good habitat.

Raccoons are abundant in this county. They are probably least numerous on the Baxter-Christian-Bewleyville soil association. These animals are likely to be found almost anywhere in areas of woodland that contain large, hollow trees. They are especially attracted to wooded areas along streams and to other bodies of water. Raccoons prefer hollow trees for their dens. Their principal plant foods are persimmons, pecans, acorns, grapes, pokeberries, and corn, but they also eat crayfish, insects, frogs, and small mammals.

Mink are common and are distributed fairly evenly throughout the county. They prefer wooded areas along streams and lakes. Their home is most often a brushpile or a burrow in a streambank. Mink spend most of their lives near water, where they feed on sick muskrats, aquatic insects, crayfish, frogs, and small fish. Occasionally, mink are found a considerable distance from water, if lack of food forces such a move.

Muskrats are common and are distributed about evenly throughout the county. The muskrat is another animal that requires an aquatic habitat. For its home, it generally digs a burrow in a streambank or in a bank at the edge of a pond. It also builds houses of aquatic vegetation. The stems and roots of cattails, rushes, and other kinds of aquatic vegetation are the principal food of muskrats. Sometimes muskrats eat frogs, turtles, and fish. At certain times of the year, they migrate to other areas. As a result, muskrats constantly reappear in farm ponds from which they have been removed.

Red and *gray fox* are common in this county. They may be encountered nearly anywhere in the county, but they are most likely to be seen on the Westmoreland-Caneyville-Baxter association.

Red foxes are most numerous in rolling or hilly country where there is a mixture of meadows, areas used for crops, and fairly open woodland. The den is generally an abandoned groundhog burrow. About 45 percent of the food of the red fox consists of rabbits and mice, about 20 percent consists of insects, and another 20 percent consists of vegetable matter, such as persimmons and grapes. Birds make up the rest.

The gray fox is more secretive than the red fox. It seems to prefer river bottoms, bluffs or cliffs, and areas of fairly open brushland. The gray fox is less likely than the red fox to make its den in the ground. Instead, it may use a hollow log or a hole in a cliff. The gray fox has the ability to climb trees. Its food habits are about the same as those of the red fox, except that it probably eats more vegetable matter.

Game and rough fish. In this county the principal streams that have important populations of fish are the Green River, Russell Creek, and Pettys Fork. In all three, game fish are abundant. Rough fish are less numerous and are rated as common. No commercial fishing is done in any of these streams.

Large numbers of both game and rough fish are not found together in the same body of water. That is because these two different kinds of fish require, or can tolerate, water with markedly different physical and chemical properties. Generally, rough fish can tolerate water that contains less oxygen than can game fish. Also, they feed largely by taste and smell, or by rooting in the bottom ooze, and therefore they require water that is less clear than that required by the game fish, which need to see their food. This partly explains why water that is laden with silt, or water that is polluted with chemicals, is generally devoid of the more desirable kinds of game fish.

Farm ponds have been built throughout the county on soils suitable for that purpose. Most of them have been stocked with fish by the Kentucky Department of Fish and Wildlife Resources and have become an important source of sport fishing.

Wildlife productivity groups

Soils vary in their ability to accommodate wildlife according to their ability to support a wide variety and large amount of vegetation. On this basis, the soils of Adair County have been placed in wildlife productivity groups.

WILDLIFE PRODUCTIVITY GROUP 1

The soils in this group are high or very high in moisture-supplying capacity, and they are moderately high or high in natural fertility. These soils are the most productive in the county, and they are capable of supporting a wide variety and a large amount of vegetation. The following soils are in this group:

Bewleyville silt loam, 2 to 6 percent slopes.
Bewleyville silt loam, 6 to 12 percent slopes.
Bewleyville silt loam, 6 to 12 percent slopes, eroded.
Christian silt loam, 2 to 6 percent slopes.
Christian silt loam, 6 to 12 percent slopes.
Christian silt loam, 6 to 12 percent slopes, eroded.
Cookeville silt loam, 6 to 12 percent slopes, eroded.
Dickson silt loam, 2 to 6 percent slopes.
Etowah silt loam, 2 to 6 percent slopes.
Etowah silt loam, 6 to 12 percent slopes.
Humphreys silt loam, 6 to 12 percent slopes.
Huntington silt loam.
Huntington fine sandy loam.
Lindside silt loam.
Pembroke silt loam, 2 to 6 percent slopes.
Pembroke silt loam, 6 to 12 percent slopes.
Sequatchie silt loam, 0 to 4 percent slopes.
Staser silt loam.
Staser loam.

About 56 percent of the acreage is used for field crops, 28 percent is used for pasture, 13 percent is used for trees, and the rest is idle. Although these soils are capable of accommodating large numbers of animals and birds, both migratory and resident, rabbits and mourning doves are probably more numerous than any other species because of the present land use. The habitat for bobwhite quail could be improved by establishing hedgerow plantings around fields used for crops or pastures. Other species can best be benefited by protecting the areas of woodland and idle land from grazing. Fishponds constructed on these soils will probably produce 600 to 1,000 pounds of fish per surface acre without fertilization.

WILDLIFE PRODUCTIVITY GROUP 2

The soils in this group are moderately low to high in moisture-supplying capacity, and they are moderate or moderately low in natural fertility. The range of plants that they are capable of supporting is nearly as wide as can be supported on the soils of wildlife productivity group 1. These soils are less fertile, however, than the soils of group 1. As a result, a smaller amount of vegetation is produced. The following soils are in this group:

Baxter cherty silt loam, 2 to 6 percent slopes.
Baxter cherty silt loam, 6 to 12 percent slopes.
Baxter cherty silt loam, 12 to 20 percent slopes.
Baxter cherty silt loam, 6 to 12 percent slopes, eroded.

Baxter cherty silt loam, 12 to 20 percent slopes, eroded.
Baxter cherty silt loam, 20 to 30 percent slopes, eroded.
Bruno loamy fine sand.
Captina silt loam, 2 to 6 percent slopes.
Christian silty clay loam, 6 to 12 percent slopes, severely eroded.
Christian silty clay loam, 12 to 20 percent slopes, severely eroded.
Christian silt loam, 12 to 20 percent slopes.
Christian silt loam, 12 to 20 percent slopes, eroded.
Christian very rocky soils, 8 to 20 percent slopes, eroded.
Christian fine sandy loam, 6 to 12 percent slopes, eroded.
Christian fine sandy loam, 12 to 20 percent slopes, eroded.
Christian-Baxter cherty loams, 6 to 12 percent slopes, eroded.
Christian-Baxter cherty loams, 12 to 20 percent slopes, eroded.
Christian-Baxter cherty loams, 20 to 30 percent slopes, eroded.
Frankstown cherty silt loam, 2 to 6 percent slopes.
Frankstown cherty silt loam, 6 to 12 percent slopes.
Frankstown cherty silt loam, 6 to 12 percent slopes, eroded.
Frankstown cherty silt loam, 12 to 20 percent slopes.
Frankstown cherty silt loam, 12 to 20 percent slopes, eroded.
Humphreys cherty silt loam, 2 to 6 percent slopes.
Humphreys cherty silt loam, 6 to 12 percent slopes.
Humphreys cherty silt loam, 6 to 12 percent slopes, eroded.
Humphreys cherty silt loam, 12 to 20 percent slopes, eroded.
Humphreys cherty silt loam, 20 to 30 percent slopes.
Humphreys cherty silt loam, 20 to 30 percent slopes, eroded.
Humphreys cherty silt loam, shallow, 12 to 20 percent slopes, eroded.
Huntington gravelly loam.
Landisburg silt loam, 0 to 2 percent slopes.
Landisburg silt loam, 2 to 6 percent slopes.
Landisburg silt loam, 6 to 12 percent slopes.
Landisburg cherty silt loam, 0 to 2 percent slopes.
Landisburg cherty silt loam, 2 to 6 percent slopes.
Lawrence silt loam.
Mountview silt loam, 2 to 6 percent slopes.
Mountview silt loam, 6 to 12 percent slopes.
Mountview silt loam, 6 to 12 percent slopes, eroded.
Mountview silt loam, shallow, 2 to 6 percent slopes.
Mountview silt loam, shallow, 6 to 12 percent slopes.
Mountview silt loam, shallow, 6 to 12 percent slopes, eroded.
Mountview silt loam, shallow, 12 to 20 percent slopes.
Mountview silt loam, shallow, 12 to 20 percent slopes, eroded.
Needmore silt loam, 2 to 6 percent slopes.
Needmore silt loam, 6 to 12 percent slopes.
Needmore silty clay loam, 2 to 6 percent slopes, eroded.
Newark gravelly silt loam.
Newark silt loam.
Staser gravelly loam.
Sango silt loam, 0 to 2 percent slopes.
Sango silt loam, 2 to 6 percent slopes.
Taft silt loam.
Talbott silt loam, 6 to 12 percent slopes, eroded.
Westmoreland shaly silt loam, 2 to 6 percent slopes.
Whitwell silt loam.
Wolftever silt loam.

Approximately 23 percent of the acreage is used for field crops, 38 percent is used for pasture, 24 percent is wooded, and the rest is idle. On a farm that has land in all these uses in about the same proportion as described, conditions are particularly attractive for bobwhite quail and rabbits.

Those furbearers that live farthest from water and farthest from the less settled areas of the county—raccoon, skunk, opossum, and red fox—are probably most abundant on these soils. Gray squirrels would benefit if livestock were excluded from the wooded areas. Because of the limitations imposed by lack of fertility, these soils are capable of supporting only moderate populations of migratory and resident wildlife species. Fishponds constructed on these soils will probably produce from 200 to 600 pounds of fish per surface acre without fertilization.

WILDLIFE PRODUCTIVITY GROUP 3

The distinguishing characteristic common to all the soils in this group is that they are severely limited in their ability to support a wide variety and a large amount of vegetation. Some of the soils are high in fertility, but, because they are wet, only limited kinds of vegetation can grow on them. Others support only limited kinds of vegetation because they are droughty. Still others, even when their moisture-supplying capacity is adequate, support only a limited amount of vegetation because of low fertility. The following soils are in this group:

- Baxter cherty silty clay loam, 12 to 20 percent slopes, severely eroded.
- Baxter cherty silty clay loam, 20 to 30 percent slopes, severely eroded.
- Bodine cherty silt loam, 6 to 12 percent slopes.
- Bodine cherty silt loam, 12 to 20 percent slopes.
- Bodine cherty silt loam, 20 to 30 percent slopes.
- Bodine cherty silt loam, 30 to 50 percent slopes.
- Caneyville very rocky soils, 20 to 30 percent slopes, eroded.
- Caneyville very rocky soils, 20 to 30 percent slopes, severely eroded.
- Caneyville very rocky soils, 30 to 45 percent slopes, eroded.
- Caneyville very rocky soils, 30 to 45 percent slopes, severely eroded.
- Christian very rocky soils, 12 to 20 percent slopes, severely eroded.
- Christian-Baxter cherty loams, 20 to 30 percent slopes, severely eroded.
- Colyer shaly silt loam, 12 to 30 percent slopes.
- Dunning silt loam.
- Gullied land.
- Guthrie silt loam.
- Landisburg cherty silt loam, 6 to 12 percent slopes.
- Landisburg cherty silt loam, 6 to 12 percent slopes, eroded.
- Landisburg cherty silt loam, 12 to 20 percent slopes, eroded.
- Landisburg silt loam, 6 to 12 percent slopes, eroded.
- Melvin silt loam.
- Muskingum very fine sandy loam, 18 to 30 percent slopes.
- Needmore silty clay loam, 6 to 12 percent slopes, eroded.
- Needmore silty clay loam, 12 to 20 percent slopes, eroded.
- Needmore silty clay, 8 to 20 percent slopes, severely eroded.
- Robertsville silt loam.
- Rockcastle silt loam, 12 to 20 percent slopes.
- Rockcastle silt loam, 20 to 30 percent slopes.
- Rockcastle silt loam, 30 to 40 percent slopes.
- Rock land.
- Rock outcrop.
- Talbott very rocky silt loam, 12 to 20 percent slopes, eroded.
- Talbott very rocky silt loam, 20 to 30 percent slopes, eroded.
- Talbott very rocky silty clay, 12 to 20 percent slopes, severely eroded.
- Talbott very rocky silty clay, 20 to 30 percent slopes, severely eroded.
- Westmoreland shaly silt loam, 6 to 12 percent slopes.
- Westmoreland shaly silt loam, 12 to 20 percent slopes.
- Westmoreland shaly silt loam, 20 to 30 percent slopes.
- Westmoreland shaly silt loam, 30 to 55 percent slopes.
- Westmoreland shaly silty clay loam, 12 to 30 percent slopes, severely eroded.
- Westmoreland shaly silty clay loam, 30 to 50 percent slopes, severely eroded.

The herbaceous plants that grow well on the wet soils are cattails, sedges, and smartweed. Only about 2 percent of the acreage is cultivated, 17 percent is used for pasture, 52 percent is used for trees, and 29 percent is idle. Because little of the acreage occupied by these soils is cultivated, there are only a few quail, rabbits, and mourning doves. The wet soils attract migrating waterfowl, however, and these soils can be developed to make them more attractive. They accommodate both mink and muskrat in moderate numbers. The soils in this group are probably more productive of ruffed grouse and gray fox than are the soils of the other two groups. Their total potential for production of all kinds of wildlife, however, is considerably less.

Creating openings in the areas that have the most extensive forests, and seeding the openings to palatable grasses and legumes would improve the habitat for deer and ruffed grouse. Keeping livestock out of the woods also benefits deer and ruffed grouse, and it benefits gray squirrels as well. Probably the best way to improve the habitats for wildlife on these soils, however, is by using practices that build up soil fertility. Fishponds constructed on these soils will probably produce about 200 pounds of fish per surface acre without fertilization.

Engineering Uses of Soils

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, the foundations of buildings, systems to provide drainage, facilities for storing water, structures to control erosion, and uses of the soils for other engineering purposes. The soil properties most important to the engineer include permeability to water, shear strength, compaction characteristics, soil drainage, shrink-swell characteristics, grain size, plasticity, and reaction. The topography and the depth to the water table and to bedrock are also important.

The information in this report can be used by engineers to—

1. Make soil and land use studies that will aid in selecting and developing industrial, business, residential and recreational sites.
2. Make preliminary estimates of the engineering properties of soils for the planning of agricultural drainage systems, farm ponds, irrigation systems, and diversion terraces.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting locations for highways, airports, pipelines, and cables and in planning detailed investigations at the selected locations.
4. Locate probable sources of gravel, sand, and other construction materials.
5. Correlate performance of engineering structures with soil mapping units, and thus develop information that will be useful in designing and maintaining the structures.
6. Determine the suitability of the soils for cross-country movement of vehicles and construction equipment.
7. Supplement the information obtained from other published maps and reports and aerial photographs for the purpose of making maps and reports that can be used readily by engineers.
8. Develop other preliminary estimates for construction purposes pertinent to the particular area.

It is not intended that this report will eliminate the need for sampling and testing the soil material at the site

for design and construction of specific engineering works. Instead, the information should be used primarily in planning more detailed field investigations to determine the condition of the soil material in place at the proposed site of construction.

Some terms used by the soil scientist may be unfamiliar to the engineer. Most of these terms, as well as other special terms used in this report, are defined in the Glossary at the back of the report.

Engineering classification systems

Most highway engineers classify soil materials in accordance with the system approved by the American Association of State Highway Officials (*1*, *6*, *12*). In this system soil materials are classified in seven principal groups. The groups range from A–1, consisting of gravelly soils of high bearing capacity, to A–7, consisting of clayey soils that have low strength when wet. These groups are shown in table 5. Within each of the principal groups, the relative engineering value of the soil material is indicated by a group index number. These numbers range from 0 for the best material to 20 for the poorest. For the soils tested, the group index number is shown in parentheses, following the soil group symbol in the next to last column of table 7.

Some engineers prefer to use the Unified Soil Classification system (*17*). In this system the soils are identified according to their texture and plasticity and are grouped according to their performance as engineering construction materials. The system establishes 15 soil groups, which are divided as (1) coarse-grained soils (eight classes), (2) fine-grained soils (six classes), and (3) highly organic soils. The classification of the soils that were tested according to the Unified system is given in table 7.

Engineering descriptions of the soils

Table 5 gives a brief description of the soils mapped in Adair County. It also gives the textural classification of the U.S. Department of Agriculture, estimates of the classification used by the American Association of State Highway Officials, and estimates of the Unified classification. In addition, the grain size, permeability, available water capacity, reaction, and shrink-swell potential are estimated. In this table the description of the soil properties is based on a single typical profile for each soil mapped. The profile is divided into layers significant to engineering, according to the depth, in inches, from the surface. A more complete description of each profile may be found in the section "Formation, Classification, and Morphology of Soils."

The depth to the seasonally high water table and the depth to bedrock were estimated in the field by observing each soil during the progress of the survey. In some soils the depth to the seasonally high water table is greater than the depth to bedrock. This is possible in formations of pervious sedimentary rock, such as cavernous limestone. Generally, within each soil type, the depth to bedrock is greater on the more gentle slopes than on the eroded and steep slopes.

The brief description of the soils gives the position of the soils on the landscape, the texture and thickness of significant horizons, and some properties of the parent material. It also shows which soils contain a pan, or layer of soil material that is nearly impervious. Such soils become waterlogged during periods of rainy weather, and water stands in them. This is indicated in table 5 by stating that the pan causes a perched water table in rainy seasons.

The percentage of soil material passing through sieves of various sizes was estimated on the basis of test data for soils in Adair County and on similar test data available for the same soil types in other areas. For soils for which no test data were available, the estimates were based on the texture of the soil material and on the amount of coarse material in the soil, using test data for similar soils as a guide.

The permeability of each soil layer was estimated for uncompacted soil material in place. The estimates were made by observing the soils in the field and by studying their structure and consistence.

The available water capacity, expressed in inches per inch of soil depth, is the approximate amount of capillary water held in the soil when wet to field capacity. This amount of water will wet air-dry soil to a depth of 1 inch without deeper percolation. These estimates were based on the texture and percentage of coarse material in the soil.

The shrink-swell potential is an indication of the volume change to be expected of the soil material with a change in moisture content. It is determined primarily by the amount and type of clay. Soils with a high content of montmorillonite clay have the highest shrink-swell potential. Soils that have a high shrink-swell potential tend to crack when they are dry and heave when they are wet.

In general, soils classified as CH and A–7 have a high shrink-swell potential. Sands and gravels having small amounts of slightly plastic fines, as well as most other nonplastic to slightly plastic soil materials, have a low shrink-swell potential.

Engineering properties are not described for Gullied land, Rock land, and Rock outcrop. These miscellaneous land types do not have developed profiles, either because the profile has been altered as the result of erosion, or because of the large amount of rock in the areas.

Engineering interpretations

Table 6 shows specific characteristics of the soils that affect their use for engineering purposes. These characteristics may affect the selection of a site, and they may affect the design of a structure or the application of measures to make the soils suitable for construction. The data in this table are based on estimated data given in table 5, on actual test data given in table 7, on field experience, and on the observed performance of the soils.

TABLE 5.—*Engineering description of soils*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock	Brief description of site and soil	Depth from surface
		Feet	*Feet*		*Inches*
BaB	Baxter cherty silt loam, 2 to 6 percent slopes.	20+	4 to 10 or more.	Cherty soils of the uplands; the soils consist of 1¼ feet of cherty silt loam over a thin layer of cherty silty clay loam; underlain by 3 or more feet of cherty clay; below is cherty limestone; in some places in the lower part of the soil profile, there are pockets of sand. (Warsaw or St. Louis formation.)	0 to 14 14 to 34 34 to 48 48+
BaC	Baxter cherty silt loam, 6 to 12 percent slopes.				
BaC2	Baxter cherty silt loam, 6 to 12 percent slopes, eroded.				
BaD	Baxter cherty silt loam, 12 to 20 percent slopes.				
BaD2	Baxter cherty silt loam, 12 to 20 percent slopes, eroded.				
BcD3	Baxter cherty silty clay loam, 12 to 20 percent slopes, severely eroded.				
BaE2	Baxter cherty silt loam, 20 to 30 percent slopes, eroded.				
BcE3	Baxter cherty silty clay loam, 20 to 30 percent slopes, severely eroded.				
BeB	Bewleyville silt loam, 2 to 6 percent slopes.	20+	5 to 15	Soils of the uplands; they consist of 1 foot of silt loam over 1½ feet of silty clay loam; underlain by silty clay that contains variable quantities of chert; below is limestone bedrock. (Warsaw formation.)	0 to 11 11 to 29 29+
BeC	Bewleyville silt loam, 6 to 12 percent slopes.				
BeC2	Bewleyville silt loam, 6 to 12 percent slopes, eroded.				
BoC	Bodine cherty silt loam, 6 to 12 percent slopes.	20+	2 to 5+	Soils of the uplands; they consist of ½ foot of cherty silt loam over 1 foot of cherty silty clay loam; underlain by chert beds with silty clay loam interstitial material; below is cherty limestone. (Ft. Payne formation.)	0 to 6 6 to 18 18+
BoD	Bodine cherty silt loam, 12 to 20 percent slopes.				
BoE	Bodine cherty silt loam, 20 to 30 percent slopes.				
BoF	Bodine cherty silt loam, 30 to 50 percent slopes.				
Br	Bruno loamy fine sand.	0 to 3	4+	Young soil of the flood plains; it consists of approximately 2½ feet of loamy fine sand over stratified gravel and sand. (Alluvium.)	0 to 9 9 to 28 28 to 40
CaE2	Caneyville very rocky soils, 20 to 30 percent slopes, eroded.	20+	2 to 6	Soil of the uplands; they generally consist of approximately ½ foot of silt loam over 2 to 3 feet of silty clay underlain by massive clay; the texture of the horizons is variable; in places the surface layer is loam or fine sandy loam and the subsoil is sandy clay that contains pockets of sand in the lower part; the parent material weathered from limestone and sandstone. (Warsaw formation.)	0 to 6 6 to 24 24 to 30 30 to 48
CaE3	Caneyville very rocky soils, 20 to 30 percent slopes, severely eroded.				
CaF2	Caneyville very rocky soils, 30 to 45 percent slopes, eroded.				
CaF3	Caneyville very rocky soils, 30 to 45 percent slopes, severely eroded.				
CbB	Captina silt loam, 2 to 6 percent slopes.	1½ to 2	5 to 10+	A soil of the stream terraces; it consists of 1 foot of silt loam over 1¼ feet of silty clay loam underlain by ¾ foot of silt loam; below is silty clay that contains variable amounts of gravel and chert; in some places bedrock is limestone, and in other places it is shale. (Alluvium.)	0 to 7 7 to 12 12 to 26 26 to 36 36+
ChB	Christian silt loam, 2 to 6 percent slopes.	20+	4 to 10+	Soils of the uplands; they consist of 1 foot of silt loam over 2¼ feet of silty clay; underlain by clay that contains pockets of sand and fragments of sandstone that increase in number with increasing depth; below is limestone or, in places, sandstone bedrock. (Warsaw formation.)	0 to 13 13 to 39 39 to 50 50+
ChC	Christian silt loam, 6 to 12 percent slopes.				
ChC2	Christian silt loam, 6 to 12 percent slopes, eroded.				
CmC3	Christian silty clay loam, 6 to 12 percent slopes, severely eroded.				
ChD	Christian silt loam, 12 to 20 percent slopes.				
ChD2	Christian silt loam, 12 to 20 percent slopes, eroded.				
CmD3	Christian silty clay loam, 12 to 20 percent slopes, severely eroded.				

and their estimated physical properties

Classification			Percentage passing—			Permeability	Available water capacity	Reaction	Shrink-swell potential
USDA textural class	Unified	AASHO	No. 4 sieve (4.7 mm.)	No. 10 sieve (2.0 mm.)	No. 200 sieve (0.074 mm.)				
						Inches per hour	*Inches per inch of depth*	*pH*	
Cherty silt loam	GM or ML	A-4	70 to 90	60 to 80	40 to 65	2.5 to 5.0	0.15	5.6 to 6.0	Low.
Cherty silty clay	CL or MH	A-7	80 to 95	75 to 90	70 to 85	1.0 to 2.5	0.10 to 0.11	5.6 to 6.0	Moderate.
Cherty clay	CH	A-7	70 to 95	65 to 90	60 to 90	0.8 to 2	0.11	5.6 to 6.0	High.
Cherty clay	CH	A-7	70 to 95	65 to 90	60 to 90	0.8 to 2	0.11	5.1 to 5.6	High.
Silt loam	ML or CL	A-4	95 to 100	95 to 100	75 to 95	2.5 to 5.0	0.22	5.6 to 6.0	Low to moderate.
Silty clay loam	CL	A-6	95 to 100	95 to 100	85 to 95	0.8 to 2.50	0.19	5.1 to 5.5	Moderate.
Silty clay	CH	A-7	90 to 100	85 to 95	80 to 90	0.2 to 2.50	0.16	5.1 to 5.5	High.
Cherty silt loam	GM or ML	A-4	65 to 85	55 to 75	45 to 65	5.0 to 10.0	0.15	5.1 to 5.5	Low.
Cherty silty clay loam.	GM or ML	A-4	65 to 85	55 to 75	45 to 65	2.5 to 5.0	0.13	5.1 to 5.5	Low.
Cherty silty clay loam.	CL or ML	A-4	65 to 85	55 to 75	50 to 65	2.5 to 5.0	0.13	5.1 to 5.5	Low to moderate.
Loamy fine sand	SM	A-2 or A-4	95 to 100	90 to 100	30 to 50	10+	0.09	5.1 to 5.5	Very low.
Loamy sand	SM	A-2 or A-4	90 to 100	85 to 100	25 to 45	10+	0.08	4.5 to 5.0	Very low.
Loamy sand	SM	A-2 or A-4	70 to 95	60 to 90	15 to 45	10+	0.08	4.5 to 5.0	Very low.
Rocky silt loam to fine sandy loam.	ML or CL	A-4	70 to 95	60 to 80	50 to 70	2.5 to 5.0	0.22 to 0.13	5.6 to 6.0	Low to moderate.
Clay to sandy clay.	MH or CH	A-7	75 to 95	60 to 80	50 to 65	0.8 to 2.0	0.14 to 0.15	5.1 to 5.5	High.
Clay to sandy clay.	MH or CH	A-7	75 to 95	60 to 80	50 to 65	0.8 to 2.0	0.14 to 0.15	5.1 to 5.5	Moderate to high.
Clay to sandy clay.	MH or CH	A-7	70 to 90	60 to 75	50 to 65	0.8 to 2.0	0.14 to 0.15	5.6 to 6.0	Moderate to high.
Silt loam	ML	A-4	95 to 100	95 to 100	75 to 95	2.5 to 5.0	0.22	5.1 to 6.0	Low.
Silt loam	ML or CL	A-4	95 to 100	95 to 100	75 to 95	2.0 to 5.0	0.22	5.1 to 6.0	Low to moderate.
Silty clay loam	CL	A-4	95 to 100	95 to 100	80 to 95	0.8 to 2.5	0.19	4.5 to 5.0	Moderate.
Silt loam	ML or CL	A-4	95 to 100	95 to 100	75 to 95	0.05 to 0.20	0.22	4.5 to 5.0	Low.
Silty clay	CL	A-6	75 to 90	70 to 90	65 to 85	0.2 to 2.5	0.16	4.5 to 5.0	Moderate.
Silt loam	ML or CL	A-4	85 to 95	60 to 85	55 to 80	2.5 to 5.0	0.22	5.6 to 6.5	Low to moderate
Silty clay	CL	A-7	90 to 100	75 to 90	75 to 90	0.8 to 2.50	0.16	5.1 to 5.5	Moderate.
Clay	CH	A-7	85 to 100	65 to 85	60 to 80	0.8 to 2.50	0.14	5.1 to 5.5	High.
Clay	CH	A-7	60 to 80	45 to 65	55 to 70	0.8 to 2.50	0.14	5.1 to 5.5	High.

TABLE 5.—*Engineering description of soils and*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock	Brief description of site and soil	Depth from surface
		Feet	*Feet*		
CfC2 CfD2	Christian fine sandy loam, 6 to 12 percent slopes, eroded. Christian fine sandy loam, 12 to 20 percent slopes, eroded.	20+	4 to 10+	Soils of the uplands; they consist of 1 foot of fine sandy loam over 1⅝ feet of sandy clay that contains pockets of sand and sandstone fragments; below is limestone or sandstone bedrock. (Warsaw formation.)	0 to 13 13 to 33 33 to 44
CrD2 CrD3	Christian very rocky soils, 8 to 20 percent slopes, eroded. Christian very rocky soils, 12 to 20 percent slopes, severely eroded.	15+	2½ to 6+	Soils of the uplands; they consist of 1 foot of silt loam, loam, or fine sandy loam over 1¼ feet of silty clay, sandy clay, or sandy clay loam; below is clay or sandy clay material that contains sandstone and sandstone fragments; limestone bedrock is exposed in many places. (Warsaw formation.)	0 to 13 13 to 28 28+
CtE	Colyer shaly silt loam, 12 to 30 percent slopes.	20+	1 to 2	Soil of the uplands; it consists of about 1½ feet of shaly silt loam over black shale bedrock; the amount of shale increases with increasing depth. (Devonian black shale.)	0 to 11 11 to 18
CvC2	Cookeville silt loam, 6 to 12 percent slopes, eroded.	20+	6 to 12+	Soil of the uplands; it consists of ½ foot of silt loam over ¾ foot of silty clay loam; underlain by firm clay that contains a few fragments of chert that increase in number with increasing depth; below is limestone bedrock. (Warsaw formation.)	0 to 6 6 to 15 15 to 60 60 to 90+
DcB	Dickson silt loam, 2 to 6 percent slopes.	15+	4 to 10	Soil of the uplands; it consists of 1 foot of silt loam over 2 feet of silty clay loam; underlain by silty clay material that contains variable quantities of chert fragments; below is cherty limestone bedrock; a pan is at a depth of between 20 and 36 inches and causes a perched water table in rainy seasons. (Ft. Payne formation.)	0 to 11 11 to 26 26 to 34 34+
Du	Dunning silt loam.	0 to ½	4+	Soil of the flood plains; it consists of approximately ½ foot of silt loam over heavy silty clay loam underlain by silty clay; the surface layer is high in content of organic matter. (Alluvium.)	0 to 18 18 to 48
EtB EtC	Etowah silt loam, 2 to 6 percent slopes. Etowah silt loam, 6 to 12 percent slopes.	15+	3 to 15+	Soils of the stream terraces; they consist of 1¼ feet of silt loam over 1¼ feet of silty clay loam underlain by silty clay; in places sand and gravel is in the lower part. (Alluvium.)	0 to 15 15 to 29 29 to 64 64+
FtB FtC FtC2 FtD FtD2	Frankstown cherty silt loam, 2 to 6 percent slopes. Frankstown cherty silt loam, 6 to 12 percent slopes. Frankstown cherty silt loam, 6 to 12 percent slopes, eroded. Frankstown cherty silt loam, 12 to 20 percent slopes. Frankstown cherty silt loam, 12 to 20 percent slopes, eroded.	15+	6 to 12+	Soils of the uplands; they consist of approximately 1 foot of cherty silt loam over 1½ feet of cherty silty clay loam; underlain by chert beds; below is cherty limestone. (Ft. Payne formation.)	0 to 12 12 to 32 32+

their estimated physical properties—Continued

Classification			Percentage passing—			Permeability	Available water capacity	Reaction	Shrink-swell potential
USDA textural class	Unified	AASHO	No. 4 sieve (4.7 mm.)	No. 10 sieve (2.0 mm.)	No. 200 sieve (0.074 mm.)	*Inches per hour*	*Inches per inch of depth*		
Fine sandy loam	SM or ML	A-4	95 to 100	90 to 100	40 to 60	5.0 to 10.0	0.13	5.6 to 6.5	Low.
Sandy clay	CL	A-6 or A-7	95 to 100	90 to 100	50 to 75	0.8 to 2.0	0.15	5.1 to 5.5	Moderate.
Sandy clay	CL	A-6 or A-7	80 to 100	80 to 95	50 to 80	0.2 to 0.8	0.15	5.1 to 5.5	Moderate to high.
Silt loam to fine sandy loam.	ML or CL	A-4	70 to 95	60 to 80	50 to 70	2.5 to 10.0	0.13 to 0.22	5.6 to 6.0	Low to moderate.
Silty clay to sandy clay.	MH or CH	A-7	75 to 95	60 to 80	50 to 65	0.8 to 2.0	0.15 to 0.16	5.1 to 5.5	High.
Clay	MH or CH	A-7	70 to 90	60 to 75	50 to 65	0.8 to 2.0	0.14	5.1 to 5.5	High.
Shaly silt loam	ML	A-4	65 to 80	60 to 75	55 to 70	2.5 to 10.0	0.15	5.1 to 5.5	Low.
Shaly silt loam	ML	A-4	60 to 75	55 to 65	50 to 70	2.0 to 5.0	0.15	5.1 to 5.5	Low to moderate.
Silt loam	ML or CL	A-4	90 to 100	90 to 100	65 to 85	2.5 to 5.0	0.22	5.6 to 6.0	Low to moderate.
Silty clay loam	CL	A-7	90 to 100	90 to 100	65 to 90	0.8 to 2.0	0.19	5.6 to 6.0	Moderate.
Clay	MH or CH	A-7	90 to 100	70 to 90	60 to 90	0.8 to 2.0	0.14	5.6 to 6.0	High.
Clay	MH or CH	A-7	90 to 100	70 to 90	60 to 90	0.8 to 2.0	0.14	5.6 to 6.0	High.
Silt loam	ML	A-4	90 to 100	95 to 100	65 to 80	2.5 to 5.0	0.22	5.1 to 5.5	Low.
Silty clay loam	CL	A-6	90 to 100	95 to 100	70 to 85	0.8 to 2.5	0.19	5.1 to 5.5	Moderate.
Silty clay loam	CL	A-6	90 to 100	95 to 100	70 to 85	0.05 to 0.2	0.19	5.1 to 5.5	Moderate.
Silty clay	CL	A-7	70 to 95	70 to 85	65 to 80	0.2 to 0.8	0.16	5.1 to 5.5	Moderate to high.
Silty clay loam	CL	A-7	95 to 100	95 to 100	85 to 95	0.2 to 0.8	0.19	6.6 to 7.3	Moderate to high.
Silty clay	CL	A-7	100	98 to 100	90 to 100	0.2 to 0.8	0.16	6.6 to 7.3	Moderate to high.
Silt loam	ML or CL	A-4	95 to 100	95 to 100	75 to 85	2.5 to 5.0	0.22	5.6 to 6.0	Low.
Silty clay loam	CL	A-6	95 to 100	90 to 100	80 to 90	0.8 to 2.50	0.19	5.1 to 5.5	Moderate.
Silty clay	CL or CH	A-7	95 to 100	90 to 100	80 to 90	0.8 to 2.50	0.16	5.1 to 5.5	High.
Silty clay	CL	A-6	80 to 100	75 to 90	50 to 75	0.8 to 10.0	0.16	5.1 to 5.5	High.
Cherty silt loam	ML or CL	A-4	70 to 85	65 to 80	50 to 65	2.5 to 10.0	0.15	5.1 to 5.5	Low.
Cherty silty clay loam.	ML or CL	A-4 or A-6	70 to 80	60 to 75	50 to 60	2.5 to 5.0	0.13	5.8 to 5.5	Moderate.
Cherty silty clay.	ML or GM	A-6 or A-4	45 to 75	50 to 75	40 to 60	2.5 to 10.0	0.11	5.1 to 5.5	Moderate.

TABLE 5.—*Engineering description of soils and*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock	Brief description of site and soil	Depth from surface
		Feet	*Feet*		*Inches*
Gu	Guthrie silt loam.	10+	3 to 6	Soil that occurs on upland flats and in depressions; it consists of ½ foot of silt loam over 1½ feet of silty clay loam; underlain by silty clay that contains chert fragments in places; a pan is at a depth of 10 to 20 inches and causes a perched water table in rainy seasons. (Ft. Payne formation.)	0 to 6 6 to 17 17 to 45+
HcB HcC HcC2 HeD2 HcE HcE2	Humphreys cherty silt loam, 2 to 6 percent slopes. Humphreys cherty silt loam, 6 to 12 percent slopes. Humphreys cherty silt loam, 6 to 12 percent slopes, eroded. Humphreys cherty silt loam, shallow, 12 to 20 percent slopes, eroded. Humphreys cherty silt loam, 20 to 30 percent slopes. Humphreys cherty silt loam, 20 to 30 percent slopes, eroded.	10+	2½ to 10+.	Soils on stream terraces and foot slopes; they consist of ½ foot to 1¼ feet of cherty silt loam over cherty silty clay loam; underlain by sandy, gravelly, or cherty alluvium; subject to slides in wet seasons.	0 to 7 7 to 28 28+
HdC	Humphreys silt loam, 6 to 12 percent slopes.	10+	4+	A soil of foot slopes; it consists of ½ foot of silt loam over 2½ feet of silty clay loam; underlain by cherty silty clay loam; subject to slides in wet seasons.	0 to 7 7 to 36 36+
Hf	Huntington fine sandy loam.	0 to 3	4+	Deep, nearly level soil of the flood plains; it consists of 2½ feet of fine sandy loam over stratified sand, gravel, and silt. (Alluvium.)	0 to 30 30+
Hg	Huntington gravelly loam.	0 to 3	4+	Deep, nearly level soil of the flood plains; it consists of 2 feet of gravelly loam material over gravelly alluvium.	0 to 25 25+
Hu	Huntington silt loam.	0 to 3	4+	Deep, nearly level soil of the flood plains; it consists of 2½ feet of silt loam over stratified alluvium, which is gravelly in some places.	0 to 30 30+
LaA LaB LaC LaC2 LaD2	Landisburg cherty silt loam, 0 to 2 percent slopes. Landisburg cherty silt loam, 2 to 6 percent slopes. Landisburg cherty silt loam, 6 to 12 percent slopes. Landisburg cherty silt loam, 6 to 12 percent slopes, eroded. Landisburg cherty silt loam, 12 to 20 percent slopes, eroded.	4+	4+	Soils on foot slopes and stream terraces; they consist of 1 foot of cherty silt loam over 1 foot of cherty silty clay loam; underlain by 1 foot of cherty silt loam; below is cherty silty clay loam; the content of chert is variable; a pan at a depth of approximately 2 feet causes a perched water table in rainy seasons; bedrock is limestone or shale.	0 to 13 13 to 24 24 to 36 36+
LdA LdB LdC LdC2	Landisburg silt loam, 0 to 2 percent slopes. Landisburg silt loam, 2 to 6 percent slopes. Landisburg silt loam, 6 to 12 percent slopes. Landisburg silt loam, 6 to 12 percent slopes, eroded.	4+	4+	Soils on foot slopes and stream terraces; they consist of 1 foot of silt loam over 1 foot of silty clay loam; underlain by silty clay loam that is cherty in some places; a pan at a depth of about 2 feet causes a perched water table in rainy seasons.	0 to 13 13 to 24 24 to 36 36+

their estimated physical properties—Continued

Classification			Percentage passing—			Permeability	Available water capacity	Reaction	Shrink-swell potential
USDA textural class	Unified	AASHO	No. 4 sieve (4.7 mm.)	No. 10 sieve (2.0 mm.)	No. 200 sieve (0.074 mm.)				
						Inches per hour	*Inches per inch of depth*	*pH*	
Silt loam	ML or CL	A-4	95 to 100	85 to 95	50 to 80	0.8 to 2.50	0.22	5.1 to 5.5	Low.
Silty clay loam	CL	A-4 or A-6	95 to 100	85 to 95	65 to 95	0.20 to 0.80	0.19	4.5 to 5.0	Low to moderate.
Silty clay	CL	A-6	80 to 100	75 to 90	65 to 80	0.05 to 0.2	0.16	4.5 to 5.0	Moderate.
Cherty silt loam	ML or GM	A-4 or A-6	70 to 85	60 to 80	40 to 65	2.5 to 10.0	0.15	5.1 to 5.5	Low.
Cherty silty clay loam.	ML or CL	A-4 or A-6	65 to 85	60 to 80	50 to 65	2.5 to 5.0	0.13	5.1 to 5.5	Low to moderate.
Cherty silty clay loam.	ML or CL	A-4 or A-6	80 to 100	60 to 80	50 to 70	0.8 to 5.0	0.13	5.1 to 5.5	Low to moderate.
Silt loam	ML or CL	A-4 or A-6	90 to 100	85 to 95	60 to 80	2.5 to 5.0	0.22	5.1 to 5.5	Low to moderate.
Silty clay loam	CL	A-6	90 to 100	85 to 95	65 to 80	0.8 to 2.5	0.19	5.1 to 5.5	Moderate.
Silty clay loam	CL	A-6	90 to 100	80 to 90	65 to 80	0.8 to 2.5	0.19	5.1 to 5.5	Moderate.
Fine sandy loam	SM	A-4 or A-2	85 to 100	70 to 90	25 to 50	5.0 to 10+	0.13	6.1 to 6.5	Very low to low.
Gravelly fine sandy loam.	SM or GM	A-4 or A-2	65 to 90	60 to 85	25 to 50	5.0 to 10+	0.08	5.6 to 6.0	Very low to low.
Gravelly loam	ML or GM	A-4	55 to 70	50 to 65	40 to 60	2.5 to 10	0.12	5.6 to 6.0	Very low to low.
Gravelly fine sandy loam.	GM or ML	A-2 or A-4	50 to 65	45 to 60	30 to 55	2.5 to 10	0.08	5.6 to 6.0	Very low.
Silt loam	ML or CL	A-4 or A-6	95 to 100	95 to 100	75 to 95	0.8 to 2.50	0.22	6.1 to 6.5	Low to moderate.
Gravelly silt loam.	ML or CL	A-4 or A-6	70 to 90	60 to 85	50 to 80	0.8 to 5.0	0.15	6.1 to 6.5	Low to moderate.
Cherty silt loam	GM or SM or ML.	A-4	65 to 85	60 to 75	40 to 60	2.5 to 5.0	0.15	5.1 to 5.5	Low.
Cherty silty clay loam.	GM or SM or ML.	A-4 or A-7	65 to 85	60 to 75	40 to 60	0.8 to 5.0	0.13	5.1 to 5.5	Low to moderate.
Cherty silt loam	GM or SM or ML	A-4 or A-7	65 to 85	60 to 75	40 to 60	0.05 to 0.20	0.15	4.5 to 5.0	Low to moderate.
Cherty silty clay loam.	GM or SM or ML	A-4 or A-7	65 to 85	60 to 75	40 to 60	0.8 to 5.0	0.13	4.5 to 5.0	Low to moderate.
Silt loam	ML	A-4	90 to 100	85 to 95	60 to 80	2.5 to 5.0	0.22	5.1 to 5.5	Low.
Silty clay loam	CL	A-6	90 to 100	85 to 95	65 to 80	0.8 to 2.5	0.19	5.1 to 5.5	Low to moderate.
Silt loam	ML or CL	A-4 or A-6	90 to 100	85 to 95	60 to 80	0.05 to 0.20	0.22	5.1 to 5.5	Low to moderate.
Silty clay loam	CL	A-6	95 to 100	80 to 90	65 to 80	0.8 to 5.0	0.19	5.1 to 5.5	Low to moderate.

TABLE 5.—*Engineering description of soils and*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock	Brief description of site and soil	Depth from surface
		Feet	*Feet*		*Inches*
Lr	Lawrence silt loam	8+	4+	Nearly level soil of the uplands; it consists of 2 feet of silt loam material over silty clay loam that is cherty in places; a pan at a depth of 10 to 20 inches causes a perched water table in rainy seasons. (Ft. Payne formation.)	0 to 22 22 to 78
Ls	Lindside silt loam.	0 to 2	4+	Soil of the flood plains; it consists of 3 feet of silt loam over stratified silt, sand, and gravel. (Alluvium.)	0 to 14 14+
Me	Melvin silt loam.	0 to ½	4+	Soil of the flood plains that occupies nearly level to slightly depressed positions; often ponded in rainy seasons; the soil consists of ⅔ foot of silt loam over 1 foot of light silty clay loam; underlain by silt loam that is gravelly and sandy in places. (Alluvium.)	0 to 8 8 to 18 18+
MoB MoC MoC2 MsB MsC MsC2 MsD MsD2	Mountview silt loam, 2 to 6 percent slopes. Mountview silt loam, 6 to 12 percent slopes. Mountview silt loam, 6 to 12 percent slopes, eroded. Mountview silt loam, shallow, 2 to 6 percent slopes. Mountview silt loam, shallow, 6 to 12 percent slopes. Mountview silt loam, shallow, 6 to 12 percent slopes, eroded. Mountview silt loam, shallow, 12 to 20 percent slopes. Mountview silt loam, shallow, 12 to 20 percent slopes, eroded.	15+	3½	Soils of the uplands; they consist of 1 foot of silt loam over 1¼ feet of silty clay loam; underlain by 1 foot of silt loam; below is cherty clay; bedrock is cherty limestone; in the shallow units the layers in the upper part of the profile are thinner than those described and bedrock is at a depth of 1½ to 2½ feet. (Ft. Payne formation.)	0 to 11 11 to 26 26 to 34 34+
MuE	Muskingum very fine sandy loam, 18 to 30 percent slopes.	20+	1½+	Soil of the uplands that consists of ⅔ foot of very fine sandy loam over 1¼ feet of sandy clay loam underlain by sandstone bedrock; fragments of sandstone occur throughout the profile. (Ft. Payne formation.)	0 to 8 8 to 23
NdB NfB2 NdC NfC2 NfD2 NeD3	Needmore silt loam, 2 to 6 percent slopes. Needmore silty clay loam, 2 to 6 percent slopes, eroded. Needmore silt loam, 6 to 12 percent slopes. Needmore silty clay loam, 6 to 12 percent slopes, eroded. Needmore silty clay loam, 12 to 20 percent slopes, eroded. Needmore silty clay, 8 to 20 percent slopes, severely eroded.	20+	2 to 4	Soils of the uplands developed in material weathered from shale and limestone; they consist of ½ foot of silt loam, over about 2 feet of clay that contains some fragments of shale; underlain by shale. (Warsaw formation.)	0 to 7 7 to 14 14 to 30

their estimated physical properties—Continued

Classification			Percentage passing—			Permeability	Available water capacity	Reaction	Shrink-swell potential
USDA textural class	Unified	AASHO	No. 4 sieve (4.7 mm.)	No. 10 sieve (2.0 mm.)	No. 200 sieve (0.074 mm.)				
						Inches per hour	*Inches per inch of depth*	*pH*	
Silt loam	ML	A-4	95 to 100	95 to 100	75 to 95	0.8 to 2.50	0.22	5.1 to 5.5	Low.
Silty clay loam	CL	A-6	85 to 95	80 to 90	70 to 90	0.05 to 0.20	0.19	5.1 to 5.5	Low to moderate.
Silt loam	ML or CL	A-4	95 to 100	90 to 100	60 to 80	2.5 to 5.0	0.22	5.6 to 6.5	Low.
Silt loam	ML or CL	A-4	85 to 100	80 to 90	60 to 75	2.5 to 5.0	0.22	5.6 to 6.0	Low to moderate.
Silt loam	ML	A-4	95 to 100	95 to 100	75 to 95	0.8 to 2.50	0.22	6.1 to 6.5	Low.
Silty clay loam	ML or CL	A-4 or A-6	95 to 100	95 to 100	80 to 95	0.8 to 2.50	0.19	6.1 to 6.5	Low to moderate.
Silt loam	CL	A-4	95 to 100	95 to 100	75 to 95	0.8 to 2.50	0.22	6.1 to 6.5	Low.
Silt loam	ML	A-4	90 to 100	90 to 100	75 to 90	2.5 to 5.0	0.22	5.1 to 5.5	Low.
Silty clay loam	ML or CL	A-4 or A-6	90 to 100	90 to 100	75 to 90	0.8 to 2.50	0.19	5.1 to 5.5	Low to moderate.
Silty clay loam	ML or CL	A-4	90 to 100	90 to 100	75 to 90	0.8 to 2.50	0.22	5.1 to 5.5	Low to moderate.
Cherty clay	CL or CH	A-6 or A-7	75 to 100	70 to 85	60 to 80	0.2 to 0.8	0.10	5.1 to 5.5	Moderate to high.
Very fine sandy loam.	ML	A-4	90 to 100	85 to 95	50 to 75	10+	0.17	5.1 to 6.0	Low.
Sandy clay loam	CL	A-6	85 to 95	75 to 90	50 to 70	2.5 to 10	0.17	5.1 to 5.6	Moderate.
Silt loam	ML or CL	A-6	95 to 100	90 to 100	75 to 85	2.5 to 5.0	0.22	5.1 to 5.5	Low to moderate.
Clay	MH or CH	A-7	95 to 100	90 to 100	75 to 85	0.2 to 0.8	0.14	5.1 to 5.5	High.
Clay	MH or CH	A-7	90 to 100	85 to 95	75 to 85	0.2 to 0.8	0.14	5.1 to 5.5	High.

TABLE 5.—*Engineering description of soils*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock	Brief description of site and soil	Depth from surface
		Feet	*Feet*		*Inches*
Ng	Newark gravelly silt loam.	0 to 1	5+	Nearly level soil of the flood plains; it consists of 3 feet of gravelly silt loam over gravelly and sandy alluvium.	0 to 36 36+
Nk	Newark silt loam.	0 to 1	5+	Nearly level soil of the flood plains; it consists of silt loam that becomes slightly finer textured with increasing depth; in places the lower part contains gravel and sand. (Alluvium.)	0 to 18 18+
PmB PmC	Pembroke silt loam, 2 to 6 percent slopes. Pembroke silt loam, 6 to 12 percent slopes.	10+	6+	Soils of the uplands; they consist of 1 foot of silt loam over 1 foot of silty clay loam; below is silty clay material that contains finely divided chert fragments that increase in number with increasing depth; underlain by limestone bedrock. (Warsaw formation.)	0 to 11 11 to 23 23+
Rb	Robertsville silt loam.	0 to ½	5+	Soil that occupies nearly level to depressed areas on stream terraces; it consists of 1⅛ feet of silt loam over compact silty clay loam that contains gravel in places. (Alluvium.)	0 to 14 14 to 40
RcD RcE RcF	Rockcastle silt loam, 12 to 20 percent slopes. Rockcastle silt loam, 20 to 30 percent slopes. Rockcastle silt loam, 30 to 40 percent slopes.	20+	1 to 2	Soils of the uplands; they consist of ½ foot of silt loam over ¾ foot of silty clay that contains shale fragments; underlain by gray, soft shale bedrock; in places subject to slides in rainy seasons. (New Providence formation.)	0 to 6 6 to 15
SaA SaB	Sango silt loam, 0 to 2 percent slopes. Sango silt loam, 2 to 6 percent slopes.	10+	4+	Soils of the uplands that consist of 1 foot of silt loam over 1¼ feet of silty clay loam; underlain by ¾ foot of silt loam; below is silty clay loam that contains variable quantities of chert; a compact pan at a depth of 20 to 30 inches causes a perched water table in rainy seasons; bedrock is cherty limestone. (Ft. Payne formation.)	0 to 13 13 to 27 27 to 38 38+
SeB	Sequatchie silt loam, 0 to 4 percent slopes.	0 to 5	4+	Nearly level soil of stream terraces; it consists of ⅔ foot of silt loam over 1¾ feet of silty clay loam; underlain by material that is variable but generally sandy clay loam alluvium that contains some gravel.	0 to 8 8 to 30 30+
Sg	Staser gravelly loam.	0 to 3	4+	Nearly level soil of the flood plains; it consists of 2½ feet of gravelly loam over variable but generally gravelly loam material. (Alluvium.)	0 to 30 30+
Sm	Staser loam.	0 to 3	4+	Soil of the flood plains; it consists of 2½ feet of loam over loam that contains variable amounts of sand and gravel. (Alluvium.)	0 to 30 30+
St	Staser silt loam.	0 to 3	5+	Soil of the flood plains; it consists of 2½ feet of silt loam over silt loam that contains variable amounts of gravel and sand. (Alluvium.)	0 to 30 30+
Ta	Taft silt loam.	0 to 2	4+	Soil on stream terraces; it consists of 1¼ feet of silt loam over 2 feet or more of silty clay loam material that generally changes to gravelly and sandy alluvium in lower part; a pan at a depth of approximately 20 inches causes a perched water table in rainy seasons. (Alluvium.)	0 to 15 15 to 40+

and their estimated physical properties—Continued

Classification: USDA textural class	Classification: Unified	Classification: AASHO	Percentage passing—: No. 4 sieve (4.7 mm.)	Percentage passing—: No. 10 sieve (2.0 mm.)	Percentage passing—: No. 200 sieve (0.074 mm.)	Permeability	Available water capacity	Reaction	Shrink-swell potential
						Inches per hour	*Inches per inch of depth*	*pH*	
Gravelly silt loam.	GM or SM or ML.	A-4	70 to 85	60 to 80	40 to 60	2.5 to 10	0.15	5.6 to 6.0	Low.
Gravelly loam	GM or SC	A-2 or A-4	60 to 80	50 to 75	30 to 50	2.5 to 10	0.12	5.6 to 6.0	Low.
Silt loam	ML	A-4	95 to 100	95 to 100	80 to 90	2.5 to 5.0	0.22	5.6 to 6.5	Low.
Silt loam	ML or CL	A-4 or A-6	90 to 100	90 to 95	75 to 85	2.5 to 5.0	0.22	6.1 to 6.5	Low to moderate.
Silt loam	ML or CL	A-4		95 to 100	70 to 95	2.5 to 5.0	0.22	5.6 to 6.0	Low to moderate.
Silty clay loam	CL	A-6		95 to 100	80 to 95	0.8 to 2.0	0.19	5.6 to 6.0	Moderate to high.
Silty clay	CH	A-7	90 to 100	80 to 95	75 to 90	0.8 to 2.0	0.16	5.6 to 6.0	High.
Silt loam	ML or CL	A-4	95 to 100	95 to 100	75 to 95	0.8 to 2.0	0.22	5.1 to 5.5	Low to moderate.
Silty clay loam	CL	A-6	95 to 100	95 to 100	85 to 95	0.05 to 0.20	0.19	4.5 to 5.0	Moderate.
Silt loam	ML or CL	A-4 or A-6	95 to 100	90 to 100	85 to 95	0.2 to 0.8	0.22	5.1 to 5.5	Low to moderate.
Silty clay	CL	A-6	95 to 100	90 to 100	85 to 95	0.05 to 0.2	0.16	4.5 to 5.0	Moderate.
Silt loam	ML	A-4	95 to 100	95 to 100	80 to 95	2.5 to 5.0	0.22	5.1 to 5.5	Low.
Silty clay loam	ML or CL	A-4	95 to 100	95 to 100	85 to 95	0.8 to 2.5	0.19	5.1 to 5.5	Low to moderate.
Silt loam	ML or CL	A-4	95 to 100	90 to 95	80 to 95	0.05 to 0.2	0.22	4.5 to 5.0	Low to moderate.
Silty clay loam	CL	A-6	85 to 95	75 to 90	70 to 90	0.2 to 2.5	0.19	4.5 to 5.0	Moderate.
Silt loam	ML	A-4	95 to 100	95 to 100	75 to 90	2.5 to 10.0	0.22	5.1 to 5.5	Low.
Silty clay loam	ML or CL	A-4 or A-6	95 to 100	95 to 100	75 to 90	2.5 to 5.0	0.19	5.1 to 5.5	Moderate.
Sandy clay loam	ML or CL	A-4 or A-6	85 to 100	70 to 90	65 to 80	2.5 to 10.0	0.17	5.1 to 5.5	Moderate.
Gravelly loam	ML	A-4	70 to 90	65 to 85	50 to 70	2.5 to 5.0	0.15	6.1 to 6.5	Low.
Gravelly loam	ML	A-4	65 to 90	60 to 80	50 to 65	2.5 to 10.0	0.15	6.1 to 6.5	Low.
Loam	ML	A-4	90 to 100	75 to 95	60 to 75	2.5 to 5.0	0.18	6.1 to 6.5	Low.
Loam	ML	A-4	80 to 95	70 to 90	60 to 85	2.5 to 10.0	0.18	6.1 to 6.5	Low.
Silt loam	ML or CL	A-4 or A-6	95 to 100	95 to 100	75 to 95	2.5 to 5.0	0.22	6.1 to 6.5	Low to moderate.
Gravelly silt loam.	ML or CL	A-4 or A-6	70 to 90	60 to 85	50 to 80	2.5 to 10.0	0.15	6.1 to 6.5	Low to moderate.
Silt loam	ML or CL	A-4	95 to 100	95 to 100	75 to 95	0.8 to 2.50	0.22	5.1 to 5.5	Low.
Silty clay loam	CL	A-7	95 to 100	95 to 100	85 to 95	0.2 to 0.80	0.19	5.1 to 5.5	Moderate to high.

TABLE 5.—*Engineering description of soils*

Map symbol	Soil	Depth to seasonally high water table	Depth to bedrock	Brief description of site and soil	Depth from surface
		Feet	*Feet*		*Inches*
TbC2	Talbott silt loam, 6 to 12 percent slopes, eroded.	20+	3+	Soils of the uplands; they consist of ½ foot of silt loam over 2½ feet of very firm, plastic clay that contains a fine-textured component that increases in quantity with increasing depth; fragments of chert and rock in lower part; limestone bedrock is exposed in places. (Warsaw formation.)	0 to 7
TrD2	Talbott very rocky silt loam, 12 to 20 percent slopes, eroded.				7 to 36
TvD3	Talbott very rocky silty clay, 12 to 20 percent slopes, severely eroded.				36 to 48+
TrE2	Talbott very rocky silt loam, 20 to 30 percent slopes, eroded.				
TvE3	Talbott very rocky silty clay, 20 to 30 percent slopes, severely eroded.				
WeB	Westmoreland shaly silt loam, 2 to 6 percent slopes.	20+	1 to 2½	Soils of the uplands; they consist of ¼ foot of shaly silt loam over 1½ feet of shaly silty clay loam; the amount of shale increases with increasing depth; underlain by calcareous shale bedrock. (Ft. Payne formation.)	0 to 3
WeC	Westmoreland shaly silt loam, 6 to 12 percent slopes.				3 to 10
WeD	Westmoreland shaly silt loam, 12 to 20 percent slopes.				10 to 20
WeE	Westmoreland shaly silt loam, 20 to 30 percent slopes.				
WeF	Westmoreland shaly silt loam, 30 to 55 percent slopes.				
WmE3	Westmoreland shaly silty clay loam, 12 to 30 percent slopes, severely eroded.				
WmF3	Westmoreland shaly silty clay loam, 30 to 50 percent slopes, severely eroded.				
Wt	Whitwell silt loam.	0 to 2	5+	Nearly level soil of stream terraces; it consists of 1 foot of silt loam over 2 feet of silt loam that has a higher clay component; in places the lower part is gravelly or sandy. (Alluvium.)	0 to 13 13 to 36 36+
Wv	Wolftever silt loam.	0 to 3	5+	Soil of stream terraces; it consists of ⅔ foot of silt loam over silty clay loam; slightly compact in lower part; in places layers of sand or gravel are at a depth of 3 to 4 feet.	0 to 8 8 to 38+

TABLE 6.—*Engineering*

[Absence of a figure indicates no adverse

Soil series and map symbols	Suitability for—			Suitability as source of—		Features affecting suitability for—	
						Vertical alinement for highways	
	Winter grading	Road subgrade	Road fill	Topsoil	Sand and gravel	Materials	Drainage
Baxter (BaB, BaC, BaC2, BaD, BaD2, BaE2, BcD3, BcE3).	Poor	Not suitable or poor.	Fair above 1 to 1½ feet; poor below.	Not suitable or poor.	Not suitable.	Silts and clays of moderate to high plasticity; bedrock.	
Bewleyville (BeB, BeC, BeC2).	Poor	Poor	Poor	Good	Not suitable.	Silts and clays of moderate to high plasticity; bedrock.	

and their estimated physical properties—Continued

Classification			Percentage passing—			Permeability	Available water capacity	Reaction	Shrink-swell potential
USDA textural class	Unified	AASHO	No. 4 sieve (4.7 mm.)	No. 10 sieve (2.0 mm.)	No. 200 sieve (0.074 mm.)				
						Inches per hour	*Inches per inch of depth*	*pH*	
Silt loam	ML or CL	A-4 or A-6	95 to 100	90 to 95	70 to 90	2.5 to 5.0	0.22	5.6 to 6.0	Moderate.
Clay	CH	A-7	95 to 100	85 to 95	75 to 90	0.2 to 0.80	0.14	5.1 to 5.5	High.
Clay	CH	A-7	85 to 100	80 to 90	70 to 85	0.2 to 0.80	0.14	5.1 to 5.5	High.
Shaly silt loam	ML or CL	A-4	85 to 90	80 to 85	70 to 85	2.5 to 5.0	0.15	6.6 to 7.3	Low.
Shaly silty clay loam.	CL	A-6	85 to 95	75 to 90	65 to 80	0.8 to 2.50	0.13	6.1 to 6.5	Moderate.
Shaly silty clay loam.	ML or GC	A-4 or A-6	60 to 75	50 to 65	40 to 60	0.8 to 2.50	0.13	6.1 to 6.5	Low.
Silt loam	ML or CL	A-4	90 to 100	75 to 95	65 to 80	2.50 to 5.0	0. 22	5. 6 to 6. 0	Low.
Silt loam	ML or CL	A-4	90 to 100	75 to 95	65 to 80	0.8 to 2.50	0. 22	4. 5 to 5. 0	Low to moderate.
Silt loam	ML	A-4	80 to 95	70 to 90	60 to 75	0.8 to 5.0	0. 22	4. 5 to 5. 0	Low to moderate.
Silt loam	ML or CL	A-4 or A-6	95 to 100	95 to 100	75 to 95	0.8 to 2.50	0. 22	5. 1 to 5. 5	Low to moderate.
Silty clay loam	CL	A-6	95 to 100	95 to 100	80 to 95	0.2 to 0.80	0. 19	5. 1 to 5. 5	Moderate.

interpretations

features or that practice is not needed]

Features affecting suitability for—Continued						
Farm pond areas	Farm pond embankments, dikes, levees	Agricultural drainage	Irrigation	Terraces and diversions	Waterways	Sewage disposal fields
Cavernous bedrock.	Poor workability; moderate to high shrink-swell potential.		Low rate of infiltration in severely eroded phases.	Cherty	Erodible; sod difficult to establish in many of the areas; cherty.	Clayey subsoil; bedrock at a depth of less than 6 feet in places.
Cavernous bedrock.	Fair strength and stability.				Erodible; well suited to sod.	Bedrock at a depth of less than 6 feet in places.

TABLE 6.—*Engineering*

[Absence of a figure indicates no adverse

Soil series and map symbols	Suitability for—			Suitability as source of—		Features affecting suitability for—	
						Vertical alinement for highways	
	Winter grading	Road subgrade	Road fill	Topsoil	Sand and gravel	Materials	Drainage
Bodine (BoC, BoD, BoE, BoF).	Fair	Fair to good.	Fair to good.	Poor	Not suitable.	Silts and clays of low plasticity; bedrock.	
Bruno (Br)	Subject to overflow.	Fair to good.	Fair to good.	Poor	Poor	Sands with appreciable amount of fines.	Porous sand, subject to flooding.
Caneyville (CaE2, CaE3, CaF2, CaF3).	Not suitable.	Poor	Poor	Fair	Not suitable.	Clays of high plasticity; rock outcrop and bedrock at a depth of 2 to 6 feet; erodible; clayey subsoil.	
Captina (CbB)	Not suitable.	Fair	Poor in upper 3 feet; unsuitable below a depth of 3 feet.	Fair	Not suitable.	Silts and clays of low to medium plasticity.	Perched water table in wet season; often affected by seepage water.
Christian (CfC2, CfD2, ChB, ChC, ChC2, ChD, ChD2, CmC3, CmD3, CrD2, CrD3, CsC2, CsD2, CsE2, CsE3).	Poor	Poor	Poor	Fair	Not suitable.	Silts and clays of medium or high plasticity; bedrock at a depth of 4 to 10 feet; erodible; clayey subsoil.	
Colyer (CtE)	Fair	Fair; shallow over bedrock.	Fair; shallow over bedrock.	Poor	Not suitable.	Silts with slight plasticity; bedrock at a depth of 1 to 2 feet.	Shallow to impervious shale.
Cookeville (CvC2)	Not suitable.	Poor	Unsuitable or poor.	Fair	Not suitable.	Silts and clays of high plasticity; bedrock at a depth of 6 to 12 feet; erodible; clayey subsoil.	
Dickson (DcB)	Not suitable.	Poor to fair.	Fair	Fair	Not suitable.	Lean clays of moderate plasticity.	High water table; seepage at a depth of 2 to 3 feet over fragipan.
Dunning (Du)	Not suitable.	Poor	Poor	Poor	Not suitable.	Lean clays of moderate plasticity.	High water table; subject to flooding.

interpretations—Continued

features or that practice is not needed]

Features affecting suitability for—Continued						
Farm pond areas	Farm pond embankments, dikes, levees	Agricultural drainage	Irrigation	Terraces and diversions	Waterways	Sewage disposal fields
Excessive seepage in chert beds.	Good strength and stability.	--------------	Excessively drained; low fertility.	Cherty or very cherty.	Erodible; cherty; dominantly steep slopes; sod moderately difficult to establish.	Bedrock at a depth of less than 2 feet; dominantly steep.
Excessive seepage; subject to piping.	Semipervious ----	--------------	Rapid permeability; low moisture-supplying capacity.	Not needed-----	Sandy; erodible; vegetation difficult to establish; nearly level.	Subject to flooding.
Cavernous bedrock.	Low stability; high shrink-swell potential.	--------------	Steep slopes; severely eroded areas have low rate of infiltration.	Rock outcrop---	Clayey subsoil; rock outcrops.	Clayey subsoil; in places less than 6 feet to bedrock.
Permeable material below a depth of 5 feet.	--------------	--------------	Slowly permeable pan at a depth of 2 feet; moderately deep root zone.	--------------	Seepage water may require interceptor tile lines.	Slowly permeable pan causes a perched water table in wet season and causes unsatisfactory functioning of disposal field.
Bedrock generally cavernous.	Low to fair stability; high shrink-swell potential.	--------------	Slow intake in severely eroded areas.	--------------	Very erodible; well suited to sod.	Less than 6 feet to bedrock in places.
--------------	Shallow to fissile shale.	--------------	Steep slopes; shallow to bedrock.	Shallow to shale bedrock.	Shallow to bedrock; banks highly susceptible to erosion; difficult to establish sod.	Shallow to bedrock.
Cavernous bedrock.	Low stability; high shrink-swell potential.	--------------	Slow rate of intake in severely eroded areas.	No limitations---	Erodible; grows sod well.	Clayey subsoil.
Seepage below pan.	Fair strength and stability.	--------------	Pan at a depth of 2 feet; has slow permeability; moderately deep root zone.	Erodible; slowly permeable pan at a depth of 2 feet.	Slightly erodible; well suited to sod.	Slowly permeable below a depth of 2 feet; perched water table in rainy seasons.
Variable substratum; most areas suitable.	High shrink-swell potential.	Moderately slow permeability; depth to lean clays variable; seasonally high water table.	Poorly drained; moderately slow permeability.	Poorly drained--	Low, nearly level position; well suited to sod.	Not suitable, because of high water table.

TABLE 6.—*Engineering*

[Absence of a figure indicates no adverse

Soil series and map symbols	Suitability for—			Suitability as source of—		Features affecting suitability for—	
						Vertical alinement for highways	
	Winter grading	Road subgrade	Road fill	Topsoil	Sand and gravel	Materials	Drainage
Etowah (EtB, EtC)	Not suitable.	Poor to fair.	Poor to fair.	Fair	Not suitable.	Bedrock; silts and clays of low to moderate plasticity; erodible.	Moderate internal drainage.
Frankstown (FtB, FtC, FtC2, FtD, FtD2).	Poor to fair.	Poor to fair.	Fair	Poor	Not suitable.	Bedrock and chert; silts and clays of low plasticity; erodible.	Moderate internal drainage.
Guthrie (Gu)	Not suitable.	Fair	Fair	Fair	Not suitable.	Lean clays of low to moderate plasticity.	Perched water table; seepage at a depth of 2 to 3 feet over fragipan.
Humphreys (HcB, HcC, HcC2, HcD2, HcE, HcE2, HdC, HeD2).	Poor to fair.	Not suitable to fair.	Fair	Poor	Not suitable.	Bedrock; silts and clays of low to moderate plasticity; subject to slides.	Seepage on steep slopes.
Huntington (Hf, Hg, Hu)	Fair	Poor to fair.	Poor to fair.		Fair	Sand and gravel in places	High water table; subject to flooding.
Landisburg cherty silt loam (LaA, LaB, LaC, LaC2, LaD2).	Not suitable or poor.	Poor to fair.	Fair	Poor	Not suitable.	Gravel that contains a significant amount of fines or silts of slight plasticity.	Seepage at a depth of 2 or 3 feet over the fragipan.
Landisburg silt loam (LdA, LdB, LdC, LdC2).	Not suitable or poor.	Fair to good.	Fair	Fair	Not suitable.	Silts and clays of low to moderate plasticity; bedrock.	Seepage at a depth of 2 to 3 feet over fragipan.
Lawrence (Lr)	Not suitable.	Fair	Fair	Fair	Not suitable.	Lean clays of moderate to low plasticity; bedrock.	Perched water table; seepage at a depth of 1½ to 3 feet over the fragipan.
Lindside (Ls)	Not suitable.	Poor to fair.	Fair	Good	Not suitable.	Silts and clays of low plasticity.	Subject to flooding; high water table.
Melvin (Me)	Not suitable.	Poor to fair.	Fair	Fair to good.	Not suitable.	Silts and clays of low to moderate plasticity.	Subject to flooding; high water table.

interpretations—Continued

features or that practice is not needed]

Features affecting suitability for—Continued						
Farm pond areas	Farm pond embankments, dikes, levees	Agricultural drainage	Irrigation	Terraces and diversions	Waterways	Sewage disposal fields
Excessive seepage in places.	Moderate to high shrink-swell potential.			No limitations	Erodible; well suited to sod.	In places shallow to bedrock.
Chert beds; excessive seepage.	Fairly stable		Cherty soil; moderately rapid permeability.	Cherty	Moderately deep to chert beds; erodible; grows sod fairly well.	No limitations.
	Fair strength and stability.	Very slowly permeable subsoil; pan at a depth of approximately 1½ feet.	Poor drainage; shallow root zone.	Poorly drained; slow permeability in subsoil.	Nearly level; fairly well suited to sod.	Not suitable, because of poor drainage.
Moderate seepage; moderate permeability.	Fair to poor stability.		Moderate response.	Cherty	Erodible; fairly well suited to sod.	In places shallow to bedrock.
Rapidly permeable substratum; should be cored to bedrock.	Fair to good strength and stability.		Gravelly and sandy types have low moisture-holding capacity; moderately rapid permeability.	Subject to overflow.	Nearly level; well suited to sod.	Subject to flooding.
Chert	Fair strength and stability.		Slowly permeable pan at a depth of 2 feet; cherty soil; moderately deep root zone.	Cherty	Fairly well suited to sod.	Slowly permeable below a depth of 2 feet.
Seepage below pan.	Fair strength and stability.		Slowly permeable pan at a depth of 2 feet; cherty soil; moderately deep root zone.		Fairly well suited to sod.	Perched water table in rainy seasons.
Occasional chert bed below pan.	Fair strength and stability.	Very slowly permeable subsoil; pan at a depth of approximately 1½ feet.	Somewhat poorly drained; moderately deep root zone.	Not needed, because soil is nearly level.	Nearly level; well suited to sod.	Not suitable, because of somewhat poor drainage and perched water table in rainy seasons.
Rapidly permeable substratum; should be cored to bedrock.	Fair to good strength and stability.	Seasonally high water table; moderately permeable.	No limitations	Moderately well drained; permeable; subject to flooding.	Low, nearly level; well suited to sod.	Subject to flooding.
Rapidly permeable substratum; should be cored to bedrock.	Fair to good strength and stability.	Seasonally high water table; moderately permeable; no suitable outlets in many places.	Poorly drained	Poorly drained; subject to flooding.	Low, nearly level; well suited to sod.	Not suitable, because of poor drainage; subject to flooding.

TABLE 6.—*Engineering*

[Absence of a figure indicates no adverse

Soil series and map symbols	Suitability for— Winter grading	Suitability for— Road subgrade	Suitability for— Road fill	Suitability as source of— Topsoil	Suitability as source of— Sand and gravel	Features affecting suitability for— Vertical alinement for highways: Materials	Features affecting suitability for— Vertical alinement for highways: Drainage
Mountview (MoB, MoC, MoC2, MsB, MsC, MsC2, MsD, MsD2).	Not suitable or poor.	Poor to fair.	Fair	Good	Not suitable.	Silts and clays of low to moderate plasticity; bedrock; erodible.	Moderate internal drainage.
Muskingum (MuE)	Fair	Poor to fair.	Fair	Poor	Not suitable.	Sandy clays; bedrock at a depth of 1½ to 2 feet.	Seepage over bedrock.
Needmore (NdB, NdC, NeD3, NfB2, NfC2, NfD2).	Not suitable.	Poor	Poor	Poor	Not suitable.	Bedrock at a depth of 2 to 4 feet; silts and clays of high plasticity; erodible; clayey subsoil.	Seepage over bedrock.
Newark (Ng, Nk)	Not suitable.	Poor to fair.	Poor to fair.	Nongravelly types good.	Not suitable.	Silts and clays of low plasticity or gravel with appreciable amount of fines.	High water table; subject to flooding.
Pembroke (PmB, PmC)	Not suitable or poor.	Poor	Poor to fair.	Upper 2 feet good.	Not suitable.	Lean clays or clays of moderate to high plasticity; bedrock; erodible.	Moderate internal drainage.
Robertsville (Ro)	Not suitable.	Poor	Poor to fair.	Fair	Not suitable.	Silty clays of low plasticity.	Perched water table; seepage at a depth of 1½ feet over the fragipan; subject to flooding.
Rockcastle (RcD, RcE, RcF).	Not suitable.	Poor	Fair	Poor	Not suitable.	Silty clays of low to moderate plasticity; soft shale at a depth of 1 to 2 feet; subject to slides.	Seepage over bedrock.
Sango (SaA, SaB)	Not suitable.	Fair	Fair	Uppermost 2 feet good.	Not suitable.	Silts and clays of slight plasticity.	Seepage over fragipan at a depth of 2 to 3 feet.
Sequatchie (SeB)	Poor	Poor to fair.	Fair	Fair	Not suitable.	Silts and clays of slight plasticity.	Subject to flooding
Staser (Sg, Sm, St)	Poor	Poor to fair.	Poor to fair.	Nongravelly types good.	Not suitable to fair.	Silts and clays of low to moderate plasticity.	Subject to flooding
Taft (Ta)	Not suitable.	Poor to fair.	Fair	Fair	Not suitable.	Silts and clays of low to moderate plasticity.	Seepage over fragipan at a depth of 1½ to 2 feet.

interpretations—Continued

features or that practice is not needed]

Features affecting suitability for—Continued						
Farm pond areas	Farm pond embankments, dikes, levees	Agricultural drainage	Irrigation	Terraces and diversions	Waterways	Sewage disposal fields
Occasional seepage in deep cuts.	Fair strength and stability.	----------------	Permeable subsoil; deep to moderately deep root zone.	Moderately deep to bedrock in places.	Erodible; well suited to sod.	In places shallow to bedrock.
Steep slopes-----	Soil material rocky; shallow to bedrock.	----------------	Shallow to bedrock; steep slopes.	Shallow to bedrock; steep slopes.	Shallow to bedrock; steep slopes.	Shallow to bedrock.
----------------	Poor strength and stability; high shrink-swell potential.	----------------	Moderately slow permeability; shallow root zone.	Moderately deep to bedrock; plastic subsoil.	Erodible; moderately deep to bedrock; difficult to establish sod in many areas.	Slowly permeable subsoil; in places shallow to bedrock.
Permeable substratum; should core to bedrock.	Fair strength and stability.	Seasonally high water table; moderate to rapid permeability.	Seasonally high water table; permeable subsoil.	Somewhat poorly drained; subject to flooding.	Low, nearly level; well suited to sod.	Subject to flooding.
Moderate seepage; cavernous bedrock.	Low strength and stability; high shrink-swell potential.	----------------	----------------	No limitations--	Erodible; well suited to sod.	No limitations.
Moderate seepage where substratum is gravelly.	Fair strength and stability.	Seasonally high water table; very slow permeability.	Poorly drained; slowly permeable subsoil.	Poorly drained; slowly permeable subsoil.	Low, nearly level; fairly well suited to sod.	Not suitable, because of poor drainage.
----------------	Fair strength and stability.	----------------	Steep slopes; shallow to bedrock.	Shallow to bedrock; steep slopes.	Shallow to bedrock; steep slopes; sod difficult to establish.	Shallow to bedrock.
Moderate seepage below a depth of 6 feet.	Fair strength and stability.	----------------	Moderately deep root zone; slowly permeable pan at a depth of 2 feet.	Erodible; slow permeability below a depth of 2 feet.	Well suited to sod-	Slowly permeable below a depth of 2 feet; perched water table in rainy seasons.
Rapidly permeable.	Fair to good strength and stability.	----------------	Permeable soil---	Erodible; permeable.	Low, nearly level; well suited to sod.	Subject to flooding.
Rapid seepage in substratum; should core to bedrock.	Fair to good strength and stability.	----------------	Moderate to moderately rapid permeability.	Nearly level slope; subject to overflow.	Low, nearly level; well suited to sod.	Subject to flooding.
Low seepage in substratum.	Fair strength and stability.	Slowly permeable subsoil; pan at a depth of approximately 1⅔ feet.	Somewhat poorly drained; slowly permeable pan at a depth of 15 inches; moderately deep root zone.	Somewhat poorly drained; slowly permeable below a depth of 15 inches.	Nearly level; well suited to sod.	Slowly permeable below a depth of 15 inches; perched water table in rainy seasons.

TABLE 6.—*Engineering*

[Absence of a figure indicates no adverse

Soil series and map symbols	Suitability for—			Suitability as source of—		Features affecting suitability for—	
						Vertical alinement for highways	
	Winter grading	Road subgrade	Road fill	Topsoil	Sand and gravel	Materials	Drainage
Talbott (TbC2, TrD2, TrE2, TvD3, TvE3).	Not suitable.	Not suitable.	Not suitable.	Poor	Not suitable.	Clays of high plasticity; rock outcrop and bedrock; erodible; clayey subsoil.	
Westmoreland (WeB WeC, WeD, WeE, WeF, WmE3, WmF3).	Fair	Fair to good.	Fair to good.	Poor	Not suitable.	Clayey gravel or clayey silts of moderate to low plasticity; bedrock at a depth of 1 to 2½ feet.	Seepage over bedrock.
Whitwell (Wt)	Not suitable.	Poor to fair.	Fair	Fair	Not suitable.	Silts and clays of low plasticity.	High water table; subject to flooding.
Wolftever (Wv)	Not suitable.	Poor to fair.	Poor to fair.	Fair	Not suitable.	Lean clays of moderate to low plasticity.	High water table; subject to flooding.

interpretations—Continued

features or that practice is not needed]

Features affecting suitability for—Continued						
Farm pond areas	Farm pond embankments, dikes, levees	Agricultural drainage	Irrigation	Terraces and diversions	Waterways	Sewage disposal fields
Cavernous bedrock.	Very high shrink-swell potential.	----------------	Slowly permeable subsoil; steep slopes; slow intake rate in eroded areas.	Plastic subsoil; rocky.	Severe erosion; plastic subsoil; vegetation difficult to establish; rock outcrop.	Slowly permeable subsoil; in places shallow to bedrock.
----------------	Shallow to bedrock.	----------------	Shallow to bedrock; steep slopes.	Shallow to bedrock.	Shallow to bedrock; dominantly steep slopes; sod difficult to establish.	Shallow to bedrock.
Moderate seepage where substratum is gravelly.	Fair strength and stability.	Seasonally high water table.	Somewhat poorly drained; permeable subsoil.	Somewhat poorly drained.	Low, nearly level; well suited to sod.	Not suitable, because of high water table.
Gravelly substratum in places.	----------------	Moderately slow permeability.	Moderately well drained; moderately slow permeability.	Moderately well drained; subsoil has moderately slow permeability.	Low, nearly level; well suited to sod.	Not suitable, because of high water table.

TABLE 7.—*Engineering test data* [1]

Soil type and location	Parent material	Bureau of Public Roads report No.	Depth	Horizon	Moisture-density [2]		Mechanical analysis [3]		
					Maximum density	Optimum moisture	Percentage passing sieve—		
							3 in.	2 in.	1½ in.
			Inches		*Lb. per cu. ft.*	*Percent*			
Christian fine sandy loam: ½ mile N. of Cumberland County line and 40 yards S. of State Highway No. 80.	Limestone and sandstone.	S30346	0–6	Ap	115	11	------	------	100
		S30347	6–15	B2	119	13	------	------	------
		S30348	36+	C	90	28	------	------	------
Christian silt loam: 30 yards SE. of Hopewell Baptist Church on Columbia-Bakerton Road.	Limestone, sandstone, and shale.	S30349	0–6	Ap	110	15	------	------	------
		S30350	12–27	B2	98	22	------	------	------
		S30351	35+	C	95	25	------	------	------
Christian cherty silt loam: ½ mile E. of Moss Cemetery on State Highway No. 1012.	Argillaceous cherty limestone, shale, and sandstone.	S30364	0–7	Ap	113	12	------	------	100
		S30365	11–33	B2	101	21	------	------	------
		S30366	33+	C	107	18	100	95	------
Christian cherty silt loam: 100 yards W. of Keltner Post Office.[6]	Argillaceous cherty limestone, shale, and sandstone.	S30367	0–8	Ap	114	12	100	98	96
		S30368	17–31	B22	108	18	------	100	98
		S30369	48+	C	102	19	92	86	83
Needmore silt loam: 1.1 mile N. of State Highway No. 80 on State Highway No. 531.	Soft shale	S30352	2–7	A2	107	17	------	------	------
		S30353	7–17	B2	102	21	------	------	------
		S30354	17–24	C	98	23	------	------	------
Needmore silt loam: 4.3 miles N. of State Highway No. 206 on first gravel road E. of Columbia.	Soft shale	S30355	0–7	Ap	107	18	------	------	100
		S30356	7–15	B2	93	26	------	------	------
		S30357	18–26	C	99	22	------	------	------
Rockcastle silt loam: 2 miles W. of Pellyton Post Office and 200 yards W. on gravel road.	Clay shale	S30358	1–6	A2	106	18	------	------	------
		S30359	6–15	C	105	20	------	------	------
		S30360	15+	Dr	111	17	------	------	------
Rockcastle silt loam: Pat Chelf farm in Roley Community, 25 yards in front of old house.	Clay shale	S30361	0–7	Ap	106	21	------	----	------
		S30362	7–18	C	109	17	------	------	------
		S30363	18+	Dr	115	15	------	------	------
Westmoreland shaly silt loam: 2 miles S. of Glens Fork on Highway 55 and ¼ mile E. on gravel road.[8]	Fissile limestone and shale.	S30370	3–11	A2	102	19	------	------	------
		S30371	11–18	C	99	21	------	100	99
		S30372	18+	Dr	99	22	95	88	81
Westmoreland shaly silt loam: ½ mile S. of rock quarry located 2 miles N. of Columbia.[9]	Fissile limestone and shale.	S30373	2–8	A2	100	18	------	------	100
		S30374	8–20	C	100	19	100	97	87

[1] Tests performed by the Bureau of Public Roads in accordance with standard procedures of the American Association of State Highway Officials (AASHO).

[2] Based on the Moisture-Density Relations of Soils Using a 5.5-lb. Rammer and 12-in. Drop, AASHO Designation T 99–57, Method A.

[3] Mechanical analyses according to AASHO Designation T 88. Results by this procedure frequently may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming the textural classes for soils. The reported percentages are based on total material. Laboratory test data were corrected for amount discarded in field sampling.

for soil samples taken from 10 soil profiles

Mechanical analysis—Continued [3]												Liquid limit	Plasticity index	Classification	
Percentage passing sieve—Continued							Percentage smaller than—							AASHO [4]	Unified [5]
1 in.	3/4 in.	3/8 in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.	0.001 mm.				
99	99	98	97	95	93	50	44	32	17	10	7	18	0	A-4(3)	SM.
------	------	------	------	100	99	54	49	38	26	20	17	23	7	A-4(4)	ML-CL.
------	------	------	------	100	99	89	87	78	70	63	57	86	49	A-7-5(20)	MH-CH.
------	------	------	100	99	95	66	60	46	27	20	15	26	6	A-4(6)	ML-CL.
------	------	------	------	100	99	78	74	70	61	53	47	66	37	A-7-6(20)	MH-CH.
------	------	------	------	100	99	97	93	82	64	52	41	75	39	A-7-5(20)	MH-CH.
99	92	83	75	68	66	48	45	35	16	11	8	21	2	A-4(3)	SM.
100	99	98	98	97	96	83	81	74	60	52	48	57	33	A-7-6(19)	CH.
------	------	------	------	95	94	69	66	56	45	39	38	50	28	A-7-6(16)	CL-CH.
93	88	81	73	68	66	40	29	19	11	7	6	(7)	(7)	A-4(1)	SM.
98	96	94	92	90	88	53	48	42	37	34	32	47	27	A-7-6(11)	CL.
80	78	71	67	64	62	52	51	47	36	32	27	56	30	A-7-6(14)	CH.
------	------	------	100	99	96	93	92	74	32	22	16	27	4	A-4(8)	ML CL.
------	------	------	------	100	99	98	97	84	55	42	34	44	18	A-7-6(12)	ML-CL.
------	------	------	------	100	99	98	98	86	62	50	43	53	25	A-7-6(17)	MH-CH.
99	99	99	99	98	94	84	80	65	39	29	25	33	11	A-6(8)	ML-CL.
------	------	------	------	100	99	98	98	91	74	61	55	69	36	A-7-5(20)	MH-CH.
------	------	------	------	------	100	99	99	90	70	56	49	62	33	A-7-6(20)	CH.
------	100	99	99	98	95	91	90	77	40	29	25	38	12	A-6(9)	ML-CL.
------	------	------	------	100	99	98	98	89	53	41	35	47	21	A-7-6(14)	ML-CL.
------	------	------	------	100	99	98	98	85	46	36	29	39	15	A-6(10)	ML-CL.
------	------	------	------	------	------	99	99	96	70	50	40	50	21	A-7-6(14)	ML-CL.
------	------	------	------	------	------	99	99	95	63	43	36	46	20	A-7-6(13)	ML-CL.
------	------	------	------	100	99	98	98	88	51	32	24	38	13	A-6(9)	ML-CL.
------	------	100	98	92	86	79	76	61	39	26	18	28	4	A-4(8)	ML-CL.
97	97	96	96	96	91	84	80	70	52	41	33	38	12	A-6(9)	ML-CL.
75	70	63	51	39	37	32	31	26	19	15	12	43	16	A-2-7(1)	GM-GC.
98	96	93	91	84	77	69	66	54	31	18	15	28	3	A-4(7)	ML.
84	81	73	62	53	49	43	41	34	21	14	11	29	3	A-4(2)	GM.

[4] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, Ed. 8): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, AASHO Designation M 145-49 (*1*).

[5] Based on the Unified Soil Classification System, Tech. Memo. No. 3-357, v. 1, Waterways Experiment Station, Corps of Engin March 1953 (*17*).

[6] All of the soil material below a depth of 48 inches passed a 6-inch sieve.

[7] Nonplastic.

[8] All of the soil material below a depth of 18 inches passed a 4-inch sieve.

[9] All of the soil material at a depth between 8 and 20 inches passed a 2½-inch sieve.

Because of poor drainage or because of the content of silty and clayey material that has slow permeability, few of the soils in this county are suitable for winter grading. The silty and clayey materials cannot be dried readily to optimum moisture content for moving and compaction. A limited amount of work can be done, however, on some of the more gravelly, cherty, and excessively drained soils, as well as on soils that are shallow to bedrock. The rating terms *good*, *fair*, or *poor* are used to indicate suitability for winter grading, or some of the soils are described as not suitable.

For each soil, the relative suitability for road fill and road subgrade is determined by the compaction characteristics, plasticity, and erodibility of the soil material. Generally, the gravelly, coarse-textured soils are best for road fill and road subgrade, and the highly plastic clays are poor or not suitable.

The suitability of the soil material for use as topsoil on slopes, roads, shoulders, pond embankments, and ditch lines to provide a root zone for vegetation, is determined by the texture, structure, content of organic matter, presence of coarse-textured material, and reaction. In areas that are not eroded, the uppermost 6 or 7 inches in most soils in the county is given a rating of *good* as a source of topsoil. In table 6 the ratings for suitability as a source of topsoil include the surface layer and subsoil, unless otherwise stated.

A suitable source of sand is generally not available in Adair County. In some areas gravel is available that is suitable for use on roads, in concrete work, and perhaps for other uses. The deposits are in small areas in streambeds. The areas are generally adjacent to the Staser, Huntington, Newark, and other soils of the flood plains.

Some of the features that adversely affect the vertical alinement of highways are a high water table, flooding, seepage, and low stability of the soil material. In addition bedrock is near the surface in some areas. These features are given in table 6.

In locating a site for a farm pond, the suitability of the site as a reservoir area and the presence of suitable material for the core and embankment are primary considerations. Highly permeable soils and those underlain by cherty or gravelly material or by bedrock containing crevices or caverns are not suitable for a reservoir area. In many places deep colluvium at the foot of slopes or deep alluvial deposits on flood plains have a rapidly permeable substratum and should be cored to impervious material to prevent leakage. The soils that have high shrink-swell potential, low strength and stability, or rapid permeability are undesirable for use as core and embankment material. The most desirable materials are the well-graded gravels and sands that have enough fine material to bind them together. These materials have good strength and stability, and they are very slowly permeable.

For those soils that are somewhat poorly drained or poorly drained, some of the features to be considered in determining the type and design of a drainage system are stated. Important features to consider include permeability, depth to a slowly permeable layer, texture, and depth to the seasonally high water table. Generally, the soils that are on bottom lands and that have an adequate outlet can be drained satisfactorily by subsurface drainage. Subsurface drainage is difficult to establish, however, on soils that have a slowly permeable layer near the surface. Such soils generally need surface drainage. If subsurface drainage is used, the tile lines should be placed above the pan, or slowly permeable layer. Generally, they need to be placed closer together than in areas where there is no pan. Draining these soils by using tile is probably too expensive to be justified, except where high-income crops can be produced.

The soils most desirable for irrigation are those that are nearly level and that have a high moisture-supplying capacity, a deep root zone, a moderate rate of infiltration, and a high level of fertility or good response to fertilizer. The soils that are steep, excessively drained, poorly drained, severely eroded, or shallow over bedrock or over a slowly permeable layer are the least desirable.

Depth to bedrock, erodibility, and the presence of coarse material, rock outcrops, or materials on which vegetation is difficult to establish affect the construction of terraces and diversions and also of waterways.

The thickness of the soil material, permeability, drainage, and depth to the water table are the important features to consider in locating and designing sewage disposal fields.

Engineering test data

Soil samples of the principal soil types of each of four extensive series were tested at the Bureau of Public Roads laboratory, in accordance with standard procedures of the American Association of State Highway Officials (AASHO), to help evaluate the soils for engineering purposes. The test data are given in table 7.

Formation, Classification, and Morphology of Soils

In the first part of this section, the factors of soil formation and their relation to the soils of the county are discussed. In the second part the classification and morphology of the soils are described.

Factors of Soil Formation

The properties of any soil are determined by the effects of climate and plant and animal life, acting upon parent material, as influenced by topography over periods of time. All five of these factors come into play in the formation of every soil. The relative importance of each is determined by the kind of parent material, the climate of the area, and the kinds and amounts of vegetation. It is also determined by the steepness of slope and the position of the soil on the landscape, as well as by the length of time the soil has been exposed to these forces of soil formation. Thus, the present character of every soil is determined by the past combinations of these five factors of soil formation.

Parent material [4]

Parent material is the unconsolidated mass from which a soil is formed. The chemical composition and the content of minerals in a soil are largely determined by the

[4] McFarlan's "*Geology of Kentucky*" (*10*) was used to help describe the geology of the county.

kind of rock that weathered to form the parent material. Nearly all of the soils in this county developed in material from local rock formations or in alluvium washed from soils in nearby counties that had similar rock formations as their origin. In some areas on the uplands, the soils are capped by silty material of undetermined origin.

Adair County is in a saddle of the Cincinnati Arch. The Inner Bluegrass area of Kentucky lies to the north of the county, and the Nashville Basin, to the south. To the west is the outer rim of the Illinoian Basin. The rocks that underlie the county vary in composition. The kind of rock differs within short distances. Because the soils are closely related to the underlying rocks, they are intermixed to some extent and vary from place to place, according to the parent material contributed from the various rocks of the county. Figure 7 shows a geological cross section of the county and the relationship of the soils to the underlying rocks.

All of the rocks that are exposed are sedimentary rocks of Devonian or Mississippian age. The lowest formation that is exposed is Ohio black fissile shale of Devonian age. Above the black shale is gray clay shale. Resting upon this shale are the siltstone, sandstone, shale, and cherty limestone of the Fort Payne formation. This formation varies, and generally there are lateral variations close to each other. Moderately high grade limestone, thin-bedded shale, and sandstone of the Warsaw formation overlie the Fort Payne formation. Above the Warsaw formation, at the higher elevations in the county, are remnants of moderately high grade cherty limestone of the St. Louis formation. All of these formations, except the black shale, belong to the Mississippian period.

Climate

Climate is a genetic factor that affects the physical, chemical, and biological relationships in the soil. The effects are caused primarily by precipitation and temperature. Water supports biological activity; it dissolves and transports minerals and organic residues down through the soil profile. The amount of water that percolates through the soil is determined by the amount of rainfall, the relative humidity, and the temperature; it is also determined by the degree of slope, the rate of infiltration, and the permeability of the soil. Temperature influences the kinds and amounts of plants, the kinds of animals and their activities, and the speed of physical and chemical reactions in the soil.

The soils in this county formed under a humid, temperate to warm climate. The soils are moist and are subject to leaching most of the year, except for occasional dry periods in summer. The average annual precipitation is approximately 49 inches. The largest average amount of rainfall falls in January. The smallest amount falls in October. The average annual temperature is approximately 56° F. The lowest average temperature for 1 month, 36°, is in January. The highest average, 76.8°, is in July.

Plant and animal life

Growing plants remove some of their minerals from the subsoil. When the plants decay, these minerals are returned to the surface soil together with the organic matter that has been produced. Bacteria, fungi, and other micro-organisms aid in the decay of organic substances. The organisms living in and on the soil serve to alter the mineral composition, add humus, and change the struc-

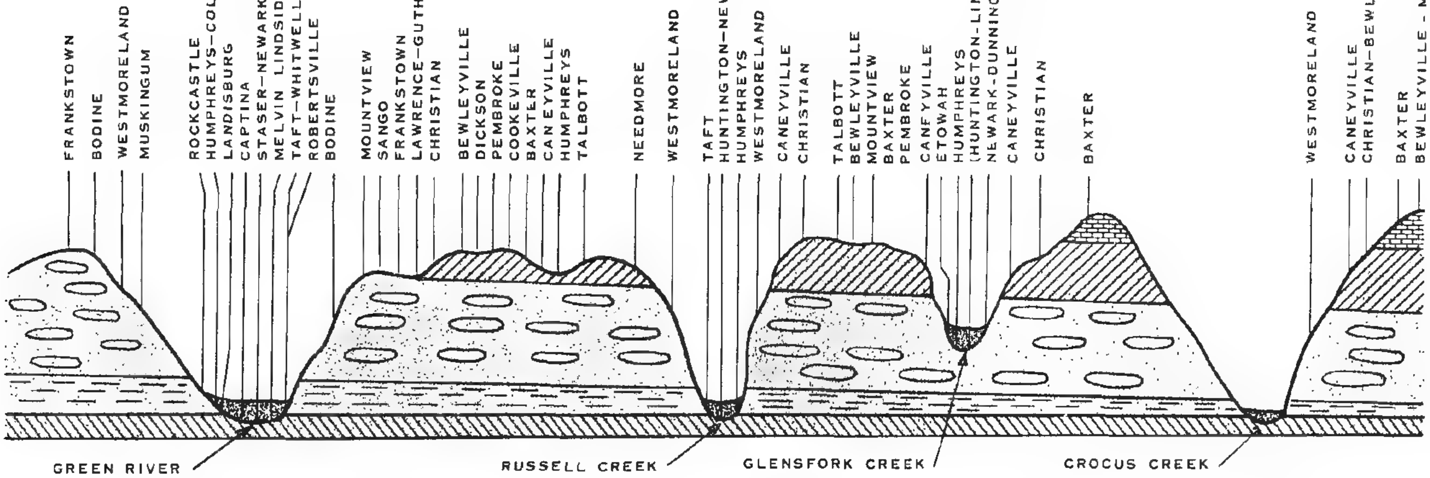

Figure 7.—Geological cross section of Adair County showing the relationship of the soils to the underlying rocks.

ture of the soil. The larger plants alter the soil microclimate. They are very effective in reducing the rate of runoff and in slowing down the process of erosion.

Except on the soils of the bottom lands and on the wet soils of the uplands, the native vegetation was chiefly oak, poplar, maple, hickory, walnut, and cedar. On the soils of the bottom lands and the wet soils of the uplands, the trees were chiefly gum, sycamore, willow, yellow-poplar, red maple, and beech. About 43 percent of the county is presently in trees.

Topography

Topography influences the formation of soils through its effects on moisture, erosion, temperature, and plant cover. The effect it has on the soils, however, is modified by the interacting effects of the other four factors of soil formation. Topography is largely determined by the underlying bedrock, the geologic history of the region, and the climate.

In this county the elevation ranges from a low of approximately 640 feet above sea level, at points of deeper dissection by streams, to a high of approximately 1,100 feet on the ridgetops. The slope range is from nearly level on bottom lands to about 55 percent on the steep walls of the valleys.

On soils that have slopes of 20 percent or more, runoff and the resulting erosion are rapid and the soil material in most places is removed almost as fast as it is formed. Soils that have slopes of 20 percent or more are generally shallow to moderately deep over bedrock, and they have weakly developed horizons.

On soils that have slopes of 6 to 20 percent, the influence of climate and of plant and animal life is more pronounced. In such areas the effects of erosion have been slow, as compared to the other effects of weathering and soil forming. The amount of rainfall that percolates downward through the profile is great enough to cause leaching of the surface layer and illuviation in the subsoil. Conditions have been more favorable for luxuriant plant growth than in steeper areas, and as a result, vegetation has been more active in the soil-forming processes. The soils that have slopes of 6 to 20 percent normally have a deep, strongly developed profile, which expresses the stronger effects of climate and of plant and animal life.

On slopes of 6 percent or less, runoff is very slow. This permits more water to percolate downward through the profile than is retained in steeper soils. The water carries with it organic matter, soluble minerals, and fine minerals from the surface layer and deposits some of them in the lower horizons. Erosion is very slow because of the small amount of runoff, and leached, weathered soil material tends to accumulate in the surface layer. In many of the flat areas or depressions, excess water that remains in the soil over long periods of time restricts the movement of air, prevents oxidation of the iron and aluminum compounds, and causes the profile to be highly leached and light colored. In time, a fragipan is likely to develop in the lower part of the subsoil, and the pan causes a perched water table.

The direction of slope also results in minor variations in soil development. On the slopes that face north, where direct exposure to sunlight is limited, the average temperature is lower, surface evaporation of moisture is slower, and conditions for growth of many plants are more favorable than on the slopes that face south.

Time

The influence of the active factors of soil formation is largely determined by the length of time these factors have taken part in the soil-forming processes. The length of time that climate and plant and animal life have been acting upon a soil is often difficult to determine. Where the action of these forces has been fairly uniform, the approximate age of the soil can be determined by the degree of development of its genetic horizons and by the position of the soil on the landscape. Young soils on the first bottoms of streams have formed in recently deposited alluvium, and they show little horizon development. Soils that have well-defined genetic horizons and that are on high stream terraces and uplands of moderate relief are considered mature. A high rate of runoff, accelerated erosion, and resistance to weathering of the parent material often prevent development of complete, well-defined genetic horizons in steep soils.

Classification and Morphology of the Soils

Soils may be classified or grouped in many different ways, for example, by texture or by suitability for a certain crop. The soils named in this survey have been correlated and fitted into a natural system of soil classification. This system permits the soils to be identified with soils of the same classification in any other county or State. The larger groupings of the system permit the comparison of soils on a national or international scale.

The system of soil classification now used in the United States has six categories. These are the order, suborder, great soil group, family, series, and type. The suborder and family categories have never been fully developed and will not be discussed.

Soils are first grouped into the lower categories, soil types and soil series. The series are then grouped into great soil groups, which, in turn, are grouped into orders. The three orders are the zonal, intrazonal, and azonal.

Some of the distinguishing characteristics of the soils in each soil series are shown in table 8, and also the great soil group and the order to which the series belongs. Following the table, the characteristics of each order, great soil group, and series are described in detail and a detailed profile is given for each soil series recognized in the county. Unless indicated otherwise, the colors described in the profiles are those of a moist soil. When the soil material is dry, the color values are one or two units higher than when the soil is moist.

TABLE 8.—*Characteristics and genetic relationships of soil series*

ZONAL SOILS

Great soil group and soil series	Brief profile description	Position	Soil drainage	Slope range	Parent material	Degree of profile development
Gray-Brown Podzolic soils:						
1. Intergrading toward Alluvial soils—				*Percent*		
Sequatchie	An Ap horizon of dark-brown silt loam over a B horizon of strong-brown silty clay loam; below is stratified alluvium.	Stream terraces.	Well drained	0 to 4	General alluvium, mainly of shale and limestone origin, but partly of sandstone origin.	Weak.
Whitwell	An Ap horizon of dark-brown silt loam over a B21 horizon of brown silt loam; the B22 horizon is brown heavy silt loam with common mottles of light gray and strong brown; the B22 overlies a C horizon of yellowish-brown silt loam at a depth of about 36 inches; the C horizon is mottled with light gray and light brownish gray.	Stream terraces.	Moderately well drained or somewhat poorly drained.	0 to 2	Alluvium of shale, limestone, and sandstone origin.	Weak.
Wolftever	An Ap horizon of dark grayish-brown silt loam over a B21 horizon of brown, compact silty clay loam; the B22 horizon is mottled, light olive-gray, yellowish-brown, and strong-brown, compact silty clay loam at a depth of about 38 inches.	Stream terraces.	Well drained or moderately well drained.	0 to 2	Alluvium, mainly of limestone origin, but partly of shale and sandstone origin.	Weak.
2. Intergrading toward Lithosols—						
Westmoreland	An A1 horizon of dark grayish-brown shaly silt loam over an A2 horizon of yellowish-brown shaly silty clay loam; below is a B horizon of yellowish-brown shaly silty clay loam that overlies shale and limestone at a depth of about 20 inches.	Uplands	Somewhat excessively drained.	2 to 50	Residuum from calcareous shale, siltstone, and limestone.	Weak to medium.
Red-Yellow Podzolic soils:						
1. Central concept—						
Baxter	An Ap horizon of grayish-brown cherty silt loam over a B1 horizon of yellowish-red cherty silty clay loam; the B2 horizon is red cherty silty clay; it overlies a B3 horizon of red cherty clay; below is variegated red, light-gray, and pale-yellow cherty clay at a depth of about 48 inches.	Uplands	Well drained	2 to 30	Cherty limestone residuum.	Strong.
Bewleyville	An Ap horizon of dark-brown silt loam over an A horizon of brown silt loam; the B1 horizon is strong-brown silty clay loam and overlies a B2 horizon of yellowish-red silty clay loam; below is a B3b horizon of dark-red silty clay that has yellowish-brown and olive-gray variegations at a depth of about 29 inches.	Uplands	Well drained	2 to 12	Mantle of loess over limestone residuum.	Moderate.

TABLE 8.—*Characteristics and genetic relationships of soil series*—Continued

ZONAL SOILS—Continued

Great soil group and soil series	Brief profile description	Position	Soil drainage	Slope range	Parent material	Degree of profile development
Red-Yellow Podzolic soils—Continued						
1. Central concept—Continued				*Percent*		
Christian	An Ap horizon of yellowish-brown silt loam over a B1 horizon of yellowish-red silty clay loam; the B2 horizon is yellowish-red silty clay and overlies a B3 horizon of yellowish-red clay; below is a C horizon of variegated red, yellowish-brown, and pale-yellow clay; this soil contains some sand; clay films are fairly prominent.	Uplands	Well drained	2 to 20	Mainly limestone, but some sandstone residuum.	Strong.
Cookeville	An Ap horizon of yellowish-brown silt loam over a B1 horizon of yellowish-red silty clay; the B21 horizon is thick and consists of dark-red, firm clay; it overlies a thick B22 horizon of red clay; below is a thick B3 horizon of red clay; clay films are noticeable throughout the B horizon; in places the C horizon is nearer the surface than that in the profile described for the series.	Uplands	Well drained	2 to 12	Limestone residuum.	Strong.
Frankstown	An Ap horizon of grayish-brown silt loam over a B1 horizon of yellowish-brown cherty silt loam; the B2 horizon is moderately thin and consists of yellowish-brown cherty silty clay loam; it overlies a thin B3 horizon of mottled strong-brown and yellowish-brown cherty silty clay loam; below are chert beds at a depth of about 32 inches.	Uplands	Well drained	2 to 20	Mainly cherty limestone, but partly siltstone residuum.	Moderate.
Humphreys	An Ap horizon of brown cherty silt loam that overlies a B1 horizon of yellowish-brown cherty silty clay loam; below is a moderately thin B2 horizon of yellowish-brown cherty silty clay loam that overlies stratified layers of alluvial material at a depth of about 28 inches.	Stream terraces.	Well drained	2 to 20	Mainly limestone residuum, but partly residuum from sandstone and shale.	Moderately strong to weak.
Mountview	An Ap horizon of light yellowish-brown silt loam over a B1 horizon of light yellowish-brown silt loam; below is a B2 horizon of yellowish-brown silt loam over a yellowish-red, faintly mottled B3 horizon of heavy silt loam; the C horizon is variegated yellowish-red, yellowish-brown, and light-gray cherty clay and is at a depth of about 34 inches.	Uplands	Well drained	2 to 20	Mantle of loess over limestone residuum.	Moderately strong.

TABLE 8.—*Characteristics and genetic relationships of soil series*—Continued

ZONAL SOILS—Continued

Great soil group and soil series	Brief profile description	Position	Soil drainage	Slope range	Parent material	Degree of profile development
Red-Yellow Podzolic soils:—Continued						
1. Central concept—Continued				*Percent*		
Needmore	An Ap horizon of dark-brown silt loam over a thin B2 horizon of strong-brown clay; the B3 horizon is thin and is variegated yellowish-red, strong-brown, and yellowish-brown clay; it overlies a C horizon of variegated light olive-brown, olive, strong-brown, and yellowish-brown, massive clay; below is weathered calcareous shale at a depth of about 30 inches.	Uplands	Well drained	2 to 20	Mainly residuum from shale and sandstone, but partly residuum from limestone.	Moderate.
Talbott	An Ap horizon of dark yellowish-brown silt loam over a B2 horizon of yellowish-red clay that has faint variegations of light yellowish-brown and has noticeable clay films; below is a B3 horizon of yellowish-red clay that has medium, distinct variegations of brownish yellow and light gray; it overlies a C horizon of variegated red, reddish yellow, and light brownish gray.	Uplands	Well drained	6 to 30	Limestone residuum	Strong to moderate.
2. With a fragipan—						
Captina	An Ap horizon of dark grayish-brown silt loam over a B1 horizon of yellowish-brown silt loam; the B2 horizon is yellowish-brown silty clay loam; it overlies a B3m horizon of yellowish-brown, mottled silt loam or silty clay loam; below is a C horizon of variegated olive-gray, strong-brown, and yellowish-brown silty clay.	Stream terraces.	Moderately well drained.	2 to 6	Alluvium, mainly of limestone origin, but partly of shale and sandstone origin.	Strong.
Dickson	An Ap horizon of brown silt loam over a B1 horizon of yellowish-brown silt loam; below is a B2 horizon of yellowish-brown silty clay loam over a B3m horizon of yellowish-brown, compact silty clay loam.	Uplands	Moderately well drained or well drained.	0 to 6	Mantle of loess over limestone residuum.	Strong.
Landisburg	An Ap horizon of brown cherty silt loam over a B1 horizon of yellowish-brown cherty silty clay loam; the B2 horizon is yellowish-brown cherty silty clay loam that has a few, fine, faint mottles of light brownish gray; it overlies a B3m horizon of mottled yellowish-brown, light brownish-gray, light olive-brown, and yellowish-red, firm, compact cherty silty clay loam; below is a C horizon of yellowish-red cherty silty clay loam, mottled with light brownish gray.	Stream terraces and toe slopes.	Moderately well drained.	2 to 20	Colluvium and alluvium from cherty limestone, shale, and sandstone.	Strong.

TABLE 8.—*Characteristics and genetic relationships of soil series*—Continued

ZONAL SOILS—Continued

Great soil group and soil series	Brief profile description	Position	Soil drainage	Slope range	Parent material	Degree of profile development
Red-Yellow Podzolic soils—Continued						
2. With a fragipan—Continued				*Percent*		
Sango	An Ap horizon of grayish-brown silt loam over an A2 horizon of light yellowish-brown silt loam; the B1 horizon is light yellowish-brown silt loam and overlies a B2 horizon of light yellowish-brown heavy silt loam; below is a light olive-brown B3m horizon of compact silty clay loam that has common, medium, distinct mottles of gray, pale yellow, and brown; it overlies chert beds and weathered limestone.	Uplands	Moderately well drained.	0 to 6	Mantle of loess over limestone residuum.	Strong.
3. Intergrading toward Reddish-Brown Lateritic soils—						
Etowah	An Ap horizon of dark-brown silt loam over an A2 horizon of dark-brown silt loam; the A3 horizon is yellowish-red silty clay loam and overlies a reddish-brown B1 horizon of silty clay loam; the B2 horizon is yellowish-red silty clay; it overlies a B22 horizon of dark-red silty clay; below is a B3 horizon of variegated red and strong-brown silty clay at a depth of about 64 inches.	Stream terraces.	Well drained	2 to 12	Old alluvium from limestone.	Moderate.
Pembroke	An Ap horizon of dark-brown silt loam over a B1 horizon of reddish-brown silty clay loam; below is a B21 horizon of dark reddish-brown silty clay loam over a B22 horizon of reddish-brown silty clay; the B3 horizon is dark-red silty clay.	Uplands	Well drained	2 to 12	Mantle of loess over limestone residuum.	Moderate.
4. Intergrading toward Lithosols—						
Caneyville	An Ap horizon of dark yellowish-brown silt loam over a B2 horizon of yellowish-red silty clay; below is a B3 horizon of yellowish-red clay that has variegations of strong brown; it overlies a C horizon of variegated yellowish-red and brownish-yellow clay.	Uplands	Well drained to somewhat excessively drained.	20 to 45	Residuum from limestone, sandstone, and shale.	Moderate.

TABLE 8.—*Characteristics and genetic relationships of soil series*—Continued

INTRAZONAL SOILS

Great soil group and soil series	Brief profile description	Position	Soil drainage	Slope range	Parent material	Degree of profile development
				Percent		
Humic Gley soils:						
Dunning	An A11p horizon of very dark grayish-brown heavy silt loam that has splotches of black silty clay loam; it overlies an A12p horizon of black heavy silty clay loam that overlies a Cg1 horizon of grayish-brown silty clay mottled with black and reddish yellow; below is a Cg2 horizon of mottled light olive-brown and dark grayish-brown silty clay at a depth of about 36 inches.	Flood plains.	Poorly drained.	0 to 2	Fine-textured alluvium of limestone origin.	Very weak.
Low-Humic Gley soils:						
Melvin	An Ap horizon of dark grayish-brown silt loam mottled with strong brown over a Cg1 horizon of light olive-gray silt loam mottled with strong brown, olive gray, and pale olive; below is a Cg2 horizon of variegated light olive-gray, strong-brown, and pale-olive silt loam at a depth of about 18 inches.	Flood plains.	Poorly drained.	0 to 2	Alluvium mainly of limestone origin, but partly of shale and sandstone origin.	Very weak.
Planosols:						
Guthrie (fragipan).	An A1 horizon of very dark grayish-brown silt loam over an A2 horizon of light brownish-gray silt loam mottled with strong brown; the B2g horizon is light brownish-gray silty clay loam mottled with strong brown and olive gray; it overlies a B3m1 horizon of mottled strong-brown, light brownish-gray, and gray, compact silty clay; below is a very compact B3m2 horizon of mottled gray, strong-brown, and olive-gray silty clay.	Uplands	Poorly drained.	0 to 4	Mantle of loess over residuum, mainly of limestone origin but partly of siltstone and shale origin.	Strong.
Lawrence (fragipan).	An Ap horizon of grayish-brown silt loam over an A2 horizon of light yellowish-brown silt loam that has a few brownish-yellow mottles; the B2g horizon is pale-yellow silt loam that has brownish-yellow and light-gray mottles; it overlies a B3mg horizon of firm, compact silty clay loam mottled with light brownish gray, light olive brown, and pale brown; below is firm silty clay at a depth of about 42 inches.	Uplands	Somewhat poorly drained.	0 to 4	Mantle of loess over residuum, mainly of limestone origin but partly of siltstone and shale origin.	Strong.
Robertsville (fragipan).	An Ap horizon of grayish-brown silt loam over an A2 horizon of light olive-gray and olive-yellow mottled silt loam; below is a B3m horizon of light-gray, yellowish-brown, and pale-olive mottled silty clay loam; this horizon overlies a C horizon of light-gray silty clay loam that is mottled with strong brown and pale olive and is at a depth of about 40 inches.	Stream terraces.	Poorly drained.	0 to 2	Alluvium, mainly of limestone origin but partly of shale and sandstone origin.	Strong.

TABLE 8.—*Characteristics and genetic relationships of soil series*—Continued

INTRAZONAL SOILS—Continued

Great soil group and soil series	Brief profile description	Position	Soil drainage	Slope range	Parent material	Degree of profile development
Planosols:—Continued				*Percent*		
Taft (fragipan)	An Ap horizon of grayish-brown silt loam over a B2 horizon of pale-olive silty clay loam mottled with light olive gray and strong brown; a B3m horizon of olive-gray compact silty clay loam mottled with strong brown and yellowish brown overlies old stratified alluvium at a depth of about 40 inches.	Stream terraces.	Somewhat poorly drained.	0 to 2	Alluvium, mainly of limestone origin but partly of shale and sandstone origin.	Strong.

AZONAL SOILS

Great soil group and soil series	Brief profile description	Position	Soil drainage	Slope range	Parent material	Degree of profile development
Alluvial soils:						
1. Central concept—				*Percent*		
Bruno	An Ap horizon of dark grayish-brown loamy fine sand over a C1 horizon of dark grayish-brown loamy sand; below is a C2 horizon of light-gray stratified sand and gravel at a depth of about 28 inches.	Flood plains.	Excessively drained.	0 to 4	Alluvium, primarily of sandstone origin.	Very weak.
Huntington	An Ap horizon of brown silt loam over a C1 horizon of dark yellowish-brown silt loam; below is a C2 horizon of dark yellowish-brown silt loam at a depth of about 30 inches; the C2 horizon overlies stratified alluvium.	Flood plains.	Well drained	0 to 4	Alluvium, mainly of limestone origin but partly of sandstone and shale origin.	Very weak.
Lindside	An Ap horizon of dark-brown silt loam over a C1 horizon of dark-brown silt loam; the C2 horizon is dark grayish-brown silt loam that has grayish-brown mottles; it overlies silt loam stratified with alluvium and mottled with brown, pale brown, and gray at a depth of about 30 inches.	Flood plains.	Moderately well drained.	0 to 4	Alluvium, mainly of limestone origin but partly of sandstone and shale origin.	Very weak.
Staser	An Ap horizon of dark grayish-brown silt loam over a C1 horizon of dark grayish-brown heavy silt loam; below is a C2 horizon of grayish-brown heavy silt loam at a depth of about 20 inches.	Flood plains.	Well drained	0 to 4	Alluvium, mainly of limestone and shale origin but partly of sandstone origin.	Very weak.
2. Intergrading toward Low-Humic Gley—						
Newark	An Ap horizon of dark grayish-brown silt loam over a C1 horizon of grayish-brown silt loam, mottled with light brownish gray; a Cg2 horizon of dark grayish-brown, mottled silt loam is at a depth of about 18 inches.	Flood plains.	Somewhat poorly drained.	0 to 2	Alluvium of limestone, shale, and sandstone origin.	Very weak.

TABLE 8.—*Characteristics and genetic relationships of soil series*—Continued

AZONAL SOILS—Continued

Great soil group and soil series	Brief profile description	Position	Soil drainage	Slope range	Parent material	Degree of profile development
Lithosols:				*Percent*		
Colyer	An A1 horizon of very dark gray, gray, thin shaly silt loam over an A2 horizon of dark grayish-brown heavy silt loam that contains fragments of weathered black shale; the C horizon is weathered black shale and overlies black shale at a depth of about 18 inches.	Uplands	Excessively drained.	12 to 30	Residuum from black, acid shale.	Weak.
Muskingum	An A1 horizon of pale-brown very fine sandy loam over an A2 horizon of brown very fine sandy loam that contains a few fragments of fine-grained sandstone; below is a BC horizon of yellowish-brown sandy clay loam that contains common fragments of sandstone; it overlies fine-grained sandstone at a depth of about 23 inches.	Uplands	Somewhat excessively drained.	12 to 30	Residuum from sandstone and siltstone.	Weak.
Rockcastle	An A1 horizon of very dark grayish-brown silt loam over an A2 horizon of pale-olive heavy silt loam that has a few, fine, olive-gray and strong-brown mottles and contains a few fragments of shale; below is a C horizon of olive-gray shaly silty clay that has mottles of strong brown, pale yellow, and light gray and fragments of shale; acid, gray clay shale is at a depth of about 15 inches.	Uplands	Somewhat excessively drained.	20 to 40	Residuum from gray clay shale.	Weak.
Regosols:						
Bodine	An Ap horizon of dark grayish-brown cherty silt loam over a B1 horizon of yellowish-brown cherty silty clay loam that has a few light-gray mottles; below are chert beds at a depth of about 18 inches.	Uplands	Excessively drained.	6 to 50	Residuum from cherty limestone and siltstone.	Weak.

Zonal soils

The zonal order consists of soils that have evident, genetically related horizons that reflect a dominant influence of climate and plant and animal life in their development. Approximately 76 percent of the county is made up of zonal soils. In this county the great soil groups that represent this order are the Gray-Brown Podzolic and the Red-Yellow Podzolic.

GRAY-BROWN PODZOLIC SOILS

The Gray-Brown Podzolic soils developed in a humid, temperate climate under deciduous forest. They generally have a layer of organic material (A0 horizon) that overlies a dark mineral layer (A1 horizon), which is 2 to 3 inches thick. Below the A1 horizon is a leached, grayish-brown layer (A2 horizon) that is 6 to 15 inches thick. This rests upon an illuviated layer (B horizon) that is brighter colored and more reddish than the horizons above, and it also contains more clay and has a blocky structure. In most places the uppermost few inches of the soil material in the A horizon has been mixed by cultivation.

None of the soils in Adair County represents the central concept of the Gray-Brown Podzolic great soil group. The Sequatchie, Whitwell, and Wolftever soils have some characteristics of Gray-Brown Podzolic soils, but they also have some characteristics of Alluvial soils; the Westmoreland soils have some characteristics of Lithosols. Soils classified as Gray-Brown Podzolic make up about 26 percent of the acreage in the county. They are described in the following pages.

Sequatchie series.—The Sequatchie series consists of well-drained, strongly acid soils that have developed in

general alluvium. The alluvium is mainly of shale and limestone origin, but partly of sandstone origin. The soils are nearly level and are in low areas on stream terraces. They have weakly developed horizons. The color of the horizons and their texture and structural development are characteristic of the Gray-Brown Podzolic soils. The horizons are weakly developed, however, and therefore the soils are considered to be intergrading toward Alluvial soils. The following describes a profile of a Sequatchie silt loam, the only soil type of this series recognized in Adair County, as it occurs in a cultivated field:

Ap—0 to 8 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; strongly acid; gradual, smooth boundary. 6 to 10 inches thick.

B1—8 to 21 inches, strong-brown (7.5YR 5/6) silty clay loam; weak, fine and medium, subangular blocky structure; friable; strongly acid; gradual, smooth boundary. 13 to 25 inches thick.

B2—21 to 30 inches, strong-brown (7.5YR 5/8) silty clay loam; weak, medium, subangular blocky structure; firm; strongly acid; gradual, smooth boundary. 8 to 12 inches thick.

C—30 inches +, dark-brown (7.5YR 4/4) to yellowish-brown (10YR 5/6), stratified beds of sand, silt, and some clay; no definite structure; strongly acid.

In places the A horizon is dark grayish brown (10YR 4/2) and the B horizon is brown (7.5YR 4/4). The C horizon varies in the amount of sand, silt, and clay it contains, and it is gravelly in places.

Whitwell series.—The Whitwell series consists of somewhat poorly drained or moderately well drained, strongly acid soils that developed in alluvium of limestone, shale, and sandstone origin. These soils occupy low-lying, nearly level areas or slight depressions, and they have weakly developed horizons. The color and texture of the horizons, as well as their structural development, are characteristic of the Gray-Brown Podzolic soils. Because the profile has only weak development, however, the soils are considered to be intergrading toward the Alluvial soils. The following describes a profile of Whitwell silt loam, the only soil type of this series recognized in Adair County, as it occurs in a cultivated field:

Ap—0 to 7 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; medium acid; gradual, smooth boundary. 6 to 8 inches thick.

B21—7 to 13 inches, brown (10YR 5/3) silt loam; weak, fine and medium, subangular blocky structure; friable; strongly acid; gradual, smooth boundary. 6 to 11 inches thick.

B22—13 to 36 inches, brown (10YR 5/3) heavy silt loam to light silty clay loam; common, medium, distinct mottles of light gray (2.5Y 7/2) and few, fine, distinct mottles of strong brown (7.5YR 5/8); weak to moderate, medium, subangular blocky structure; firm; contains few, small, dark-brown concretions and concretionary stains; very strongly acid; gradual, smooth boundary. 20 to 24 inches thick.

C—36 inches +, yellowish-brown (10YR 5/4) silt loam mottled and streaked with light gray (2.5Y 7/2) and light brownish gray (2.5Y 6/2); firm; contains some sand and gravel; strongly acid.

In places the B21 horizon is mottled grayish brown (2.5Y 5/2) or yellowish brown (10YR 5/4). The color of the B22 horizon ranges to yellowish brown (10YR 5/4) in places.

Wolftever series.—In this series are moderately well drained or well drained, strongly acid soils that have a compact subsoil. These soils are nearly level and are on low-lying stream terraces. They developed in alluvium washed from soils of limestone, shale, and sandstone origin. These soils contain a higher component of materials from limestone than do the Sequatchie and Whitwell soils. The color and texture of the soil material in the horizons, as well as the structural development, are characteristic of Gray-Brown Podzolic soils. Because the structural development is weak, however, and the horizons are not well defined, these soils are considered to be intergrading toward the Alluvial soils. The following describes a profile of a Wolftever silt loam, the only soil type of this series recognized in Adair County, as it occurs in a cultivated field:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; strongly acid; clear, smooth boundary. 6 to 10 inches thick.

B21—8 to 38 inches, brown (10YR 5/3) silty clay loam; few, fine, faint mottles of olive gray (5Y 5/2) and strong brown (7.5YR 5/6 to 5/8) in lower part; strong, moderate, blocky structure; firm, compact; strongly acid; gradual, smooth boundary. 25 to 35 inches thick.

B22—38 inches +, mottled light olive-gray (5Y 6/2), yellowish-brown (10YR 5/6 to 5/8), and strong-brown (7.5YR 5/6 to 5/8) silty clay loam; strong, medium, blocky structure; firm, compact; strongly acid.

The degree of mottling and of compaction in the B21 horizon vary.

Westmoreland series.—The Westmoreland series consists of Gray-Brown Podzolic soils that are intergrading toward the Lithosol great soil group. The soils are somewhat excessively drained and are slightly acid. They are on uplands and developed in material weathered from calcareous shale, siltstone, and limestone. These soils are gently sloping to very steep. They have a higher degree of profile development than is characteristic of the Lithosols. The soils have a leached A horizon. Their B horizon is finer textured than the A and is characteristic of the Gray-Brown Podzolic soils. The weakly developed profile and the bedrock near the surface, however, make these soils somewhat similar to the Lithosols.

Uneroded Westmoreland shaly silt loams and severely eroded Westmoreland shaly silty clay loams are mapped in this county. The following describes a profile of an uneroded, strongly sloping Westmoreland shaly silt loam in a wooded area:

A1—0 to 3 inches, dark grayish-brown (2.5Y 4/2) shaly silt loam; weak, fine, granular structure; friable; nearly neutral; clear, wavy boundary. 2 to 4 inches thick.

A2—3 to 10 inches, yellowish-brown (10YR 5/6) shaly silty clay loam; weak, fine and medium, subangular blocky structure; friable; slightly acid; gradual, smooth boundary. 6 to 8 inches thick.

B—10 to 20 inches, yellowish-brown (10YR 5/4) silty clay loam; weak to moderate, medium, subangular blocky structure; firm; slightly acid; fragments of shale are common and become more numerous with increasing depth. 8 to 12 inches thick.

Dr—20 inches +, interbedded, soft, calcareous shale and weathered, fissile limestone.

The color of the A1 horizon ranges to very dark grayish brown (10YR 3/2), the color of the A2 horizon ranges to pale brown (10YR 6/3), and that of the B horizon ranges to light yellowish brown (10YR 6/4). In places thin, patchy clay films are on the surfaces of peds. The B horizon is absent in some profiles, and instead there is a thick C horizon. Depth to material weathered from bed-

rock is a few inches deeper in some profiles than in the profile described, and a thin, very shaly C horizon occurs in places. On the more gentle slopes, there is a thin smear of yellowish-brown (10YR 5/4) silty material on the surface. In places there is a thin layer of mottled material above the Dr horizon.

The severely eroded Westmoreland soils have a plow layer of shaly silty clay loam that contains more shale and is less grayish and more yellowish than that in the profile described. In places there are shallow gullies and the weathered shale rock is exposed. In many places on the surface of a few of the steeper areas, there is some chert that has rolled down from the Bodine and Frankstown soils.

RED-YELLOW PODZOLIC SOILS

This great soil group contains well-developed, acid soils that formed under forest vegetation in a warm temperate-humid to tropical-humid climate. The Red-Yellow Podzolic soils generally have a thin layer of organic material (A0 horizon) over an organic mineral layer (A1 horizon). The A1 horizon overlies a light-colored, eluviated layer (A2 horizon), which is underlain by a yellow, yellowish-brown, yellowish-red, or red, illuviated layer (B horizon) that contains more clay than the other layers. Variegations of lighter colors are common in the lower horizons. Generally, cultivation has mixed the uppermost few inches of the A horizons.

The Baxter, Bewleyville, Christian, Cookeville, Frankstown, Humphreys, Mountview, Needmore, and Talbott series are representative of the central concept of this great soil group. The Captina, Dickson, Landisburg, and Sango soils are also Red-Yellow Podzolic soils, but they have a firm, brittle, compact fragipan (B3m horizon) at a depth of 20 to 36 inches. The Etowah and Pembroke soils are Red-Yellow Podzolic soils that intergrade toward Reddish-Brown Lateritic soils, and the Caneyville soils intergrade toward Lithosols. The Red-Yellow Podzolic soils make up about 52 percent of the county. The soil series in this great soil group are described in the following pages.

Baxter series.—The Baxter series consists of well-drained, medium acid soils of the uplands. The soils have a strongly developed profile. They developed chiefly in material weathered from cherty limestone. Some of the Baxter cherty loams that are mapped in complexes with Christian cherty loams have a component of sandstone, which is reflected in the upper part of the solum.

The Baxter soils are gently sloping to moderately steep, and they have karst relief in places. Baxter cherty silt loam, Baxter cherty loam, Baxter silt loam, Baxter very rocky silt loam, and Baxter cherty silty clay loam are the soil types of this series mapped in Adair County. Because of their small acreage, however, the Baxter silt loams in this county are mapped with the Christian soils and the Baxter very rocky silt loams are mapped with the Caneyville very rocky soils. The following describes a profile of a Baxter cherty silt loam:

Ap—0 to 6 inches, grayish-brown (10YR 5/2) cherty silt loam; weak, fine, granular structure; friable; medium acid; clear, smooth boundary. 3 to 5 inches thick.

A3—6 to 9 inches, reddish-yellow (7.5YR 7/6) cherty silt loam; weak, fine, granular structure; friable; medium acid; gradual, wavy boundary. 3 to 5 inches thick.

B1—9 to 14 inches, yellowish-red (5YR 5/8) cherty silty clay loam; weak, medium, subangular blocky structure; friable; medium acid; clear, smooth boundary. 3 to 5 inches thick.

B2—14 to 34 inches, red (2.5YR 4/6 to 4/8) cherty silty clay; moderate, medium, subangular blocky structure; firm when moist, slightly sticky when wet, and hard when dry; strongly acid; gradual, wavy boundary. 16 to 22 inches thick.

B3—34 to 48 inches, red (2.5YR 4/6 to 4/8) cherty clay; strong, angular blocky structure; firm when moist, slightly sticky when wet, hard when dry; chert fragments increase in size and in number with increasing depth; few small pockets of fine sand; strongly acid; gradual, wavy boundary. 10 to 16 inches thick.

C—48 inches +, variegated red (2.5YR 4/6 to 4/8), light-gray (2.5Y 7/2), and pale-yellow (5Y 7/4) cherty clay; firm; medium-sized and large fragments of chert are abundant; strongly acid.

The Ap horizon is dark brown (10YR 4/3) in some profiles; the texture of the B2 horizon ranges to clay. The depth to chert beds or to bedrock, and the amount of chert are variable. In places there are no small pockets of fine sand in the solum. In severely eroded areas the texture of the surface layer is silty clay loam. The Baxter cherty loams mapped in complexes with the Christian cherty loams have a grayer A horizon and more sand in the upper part of the solum than in the profile described. They also have a B2 horizon of yellowish-red cherty clay, and there is some shale in their parent material.

Bewleyville series.—The Bewleyville series consists of well-drained, medium acid or strongly acid soils of the uplands. The soils developed in part from loess or from material that resembles loess that overlies material weathered from cherty limestone. These soils are gently sloping to sloping. They have a more brownish A horizon and a more friable, less plastic, and less clayey B horizon than the Baxter, Christian, and Cookeville soils. They lack the chert content of the Baxter soils. The following describes a profile of a Bewleyville silt loam, the only soil type of this series recognized in Adair County, as it occurs in a cultivated field:

Ap—0 to 6 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; medium acid; clear, smooth boundary. 4 to 8 inches thick.

A2—6 to 11 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; medium acid; clear, smooth boundary. 3 to 7 inches thick.

B1—11 to 17 inches, strong-brown (7.5YR 5/6) light silty clay loam; moderate, fine and medium, subangular blocky structure; firm; strongly acid; clear, smooth boundary. 4 to 8 inches thick.

B2—17 to 29 inches, yellowish-red (5YR 4/6) silty clay loam; moderate, medium, angular blocky structure; firm; common clay films; strongly acid; gradual, wavy boundary. 10 to 14 inches thick.

B3b—29 inches +, dark-red (2.5YR 3/6) silty clay with streaks and splotches of light yellowish brown (10YR 6/4), yellowish brown (10YR 5/6), and olive gray (5Y 5/2); moderate, medium, angular blocky structure; strongly acid; contains few small fragments of chert.

The thickness of the solum in the areas formed mainly in loess or in material that resembles loess generally ranges from 20 to 30 inches, but in some places it is as much as 40 inches. In places the B3b horizon lacks the fragments of chert and is yellowish red (5YR 4/8).

Christian series.—The Christian soils developed mainly in material weathered from interbedded limestone and sandstone and, to a lesser degree, in material weathered from shale. They are gently sloping to strongly

sloping. The soils are well drained and are strongly acid. They have a yellowish-red, clayey, slightly plastic B horizon, and there is sand throughout their profile. Christian silt loam, Christian cherty loam, Christian silty clay loam, and Christian fine sandy loam are the soil types of this series mapped in this county. In addition, there are several mapping units consisting of very rocky Christian soils in which the textures are unclassified. The Christian silt loams occupy the largest acreage of any of the soil types in this series. The following describes a profile of a gently sloping Christian silt loam in a cultivated area:

Ap—0 to 6 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine, granular structure; very friable; medium to slightly acid; gradual, smooth boundary. 5 to 8 inches thick.

A2—6 to 13 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; medium acid; gradual, wavy boundary. 3 to 8 inches thick.

B1—13 to 18 inches, yellowish-red (5YR 5/6 to 5/8) silty clay loam; weak, fine, subangular blocky structure; friable; strongly acid; clear, smooth boundary. 3 to 7 inches thick.

B2—18 to 39 inches, yellowish-red (5YR 5/6 to 5/8) silty clay; few, fine, faint, pale-brown (10YR 6/3) mottles; strong, fine and medium, angular blocky structure; very firm when moist, very sticky when wet, hard when dry; prominent clay skins; few soft fragments of sandstone in lower part; strongly acid; gradual, wavy boundary. 15 to 28 inches thick.

B3—39 to 50 inches, yellowish-red (5YR 5/6 to 5/8) clay; common, coarse, distinct splotches of yellowish brown (10YR 5/6) and few, medium, distinct mottles of light brownish gray (2.5Y 6/2); strong, medium and coarse, angular blocky structure; very firm when moist, slightly sticky when wet, hard when dry; clay skins are fairly prominent; fragments of sandstone are common; strongly acid; gradual, wavy boundary. 7 to 16 inches thick.

C—50 inches +, variegated red (2.5YR 4/6 to 4/8), yellowish-brown (10YR 5/6), and pale-yellow (5Y 7/3 to 7/4) clay; strong, medium and coarse, angular blocky structure; firm when moist, sticky when wet, hard when dry; clay films are fairly prominent; fragments of sand and weathered sandstone are numerous; strongly acid.

In places the color of the A2 horizon is yellowish brown. The color of the B2 horizon ranges to red (2.5YR 5/6), and in places the texture of the B2 horizon is clay. The B3 horizon is red (2.5YR 5/6 to 5/8) in places. The number of fragments of sand and sandstone in the lower horizons varies. In severely eroded areas the texture of the surface layer is silty clay loam.

The profile of the Christian fine sandy loams contains more sand than the profile described. In addition, the fragments of sandstone in the lower horizons are generally more weathered and the B2, B3, and C horizons have a texture of sandy clay or sandy clay loam in places. The Christian cherty loams are mapped in complexes with the Baxter cherty loams. In most places they have a thinner, lighter colored A horizon and a more plastic, clayey C horizon than the other Christian soils. From 10 to 25 percent of the surface of the Christian very rocky soils is covered by outcrops of limestone. The Christian very rocky soils have slightly thinner horizons than the other Christian soils. The texture of the surface layer in these rocky soils ranges from silt loam to fine sandy loam in uneroded areas, and from silty clay loam or sandy clay loam to silty clay or sandy clay in severely eroded areas.

Cookeville series.—The Cookeville series consists of well-drained, medium acid soils that developed in material weathered from slightly cherty limestone. The soils are more reddish in the lower horizons and are less sandy than the Christian soils. They are less cherty than the Baxter soils, and they have a more reddish, less friable B horizon than the Bewleyville soils. The Cookeville soils are gently sloping to sloping and are on uplands. The following describes a profile of an eroded Cookeville silt loam, the only soil type of this series recognized in Adair County, as it occurs in a cultivated area:

Ap—0 to 6 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine, granular structure; friable; medium acid; clear, smooth boundary. 4 to 8 inches thick.

B1—6 to 15 inches, yellowish-red (5YR 4/6) silty clay loam; moderate, medium, subangular blocky structure; firm; clay skins impart a redder hue to many of the ped faces; a few, small, round concretions that are dark reddish brown (5YR 3/2) occur throughout the horizon; medium acid; gradual, smooth boundary. 8 to 10 inches thick.

B21—15 to 32 inches, dark-red (2.5YR 3/6) clay that contains pockets of yellowish-red (5YR 5/6 to 5/8) silty clay (probably from weathered chert); moderate, fine and medium, subangular blocky structure; firm when moist, sticky when wet, hard when dry; few, fine fragments of chert; few, small, round, black concretions; medium acid; gradual, smooth boundary. 15 to 19 inches thick.

B22—32 to 60 inches, red (10R 4/6 to 4/8) clay with few, fine, distinct splotches of yellowish brown (10YR 5/6), brown (10YR 5/3), and light brownish gray (10YR 6/2); strong, medium and coarse, angular blocky structure; firm when moist, sticky when wet, hard when dry; peds have a noticeable coating of clay films; very finely divided fragments of chert occur throughout the horizon; splotches and fragments of chert increase in size and in number with increasing depth; medium acid; clear, smooth boundary. 26 to 30 inches thick.

B3—60 to 90 inches +, red (10R 4/6) clay splotched and streaked with brown (10YR 5/3), pale yellow (2.5Y 7/4), and light grayish brown (2.5Y 5/2); coarse, angular blocky structure; firm when moist, sticky when wet, hard when dry; medium acid.

In areas that are not eroded, an A3 horizon may be identifiable in places. In addition, in some places, the Ap horizon is dark yellowish brown (10YR 4/4), the B21 horizon is red (10R 4/6), and the B22 and B3 horizons are dark red (10R 3/6). In places a C horizon occurs within the depth of the profile described.

Frankstown series.—The Frankstown series consists of well-drained, strongly acid soils of the uplands. The soils have a strongly developed profile. They developed primarily in material weathered from cherty limestone. Their A horizon in some areas, however, contains a very thin layer of loess or of material that resembles loess. In other places there is a component of material weathered from fine-grained sandstone or siltstone. The soils are gently sloping to strongly sloping. They have a less red, less clayey subsoil than the Baxter, Bewleyville, Christian, and Cookeville soils. The following describes a profile of a Frankstown cherty silt loam, the only soil type of this series recognized in Adair County, as it occurs in a cultivated area:

Ap—0 to 7 inches, grayish-brown (10YR 5/2) cherty silt loam; weak, fine, granular structure; friable; strongly acid; clear, smooth boundary. 5 to 8 inches thick.

B1—7 to 12 inches, yellowish-brown (10YR 5/4) cherty silt loam; weak, fine and medium, subangular blocky structure; friable; strongly acid; gradual, clear boundary. 4 to 6 inches thick.

B2—12 to 32 inches, yellowish-brown (10YR 5/6) cherty silty clay loam; weak, medium, angular blocky structure; firm; strongly acid; gradual, smooth boundary. 12 to 20 inches thick.

C—32 inches +, primarily a chert bed in which the interstices are filled with silty clay that is mixed yellowish red (5YR 5/8), yellowish brown (10YR 6/4), and light gray (10YR 7/2); firm; coatings of silt are common on the chert faces; strongly acid.

The content of chert varies throughout the profile. In some places the chert is flinty or sandy, and in others it is silty.

Humphreys series.—The Humphreys series consists of well-drained, strongly acid soils that have weak to moderate horizon development. These soils are on terraces, alluvial fans, and foot slopes and are gently sloping to moderately steep. They developed in old alluvium and colluvium, chiefly from soils developed in material from cherty limestone, but they contain some material washed from soils of sandstone and shale origin. Humphreys cherty silt loam and Humphreys silt loam are the soil types of this series recognized in Adair County, but there is also a shallow Humphreys cherty silt loam. The following describes a profile of a gently sloping Humphreys cherty silt loam in a cultivated area:

Ap—0 to 7 inches; brown (10YR 5/3) cherty silt loam; weak, fine, granular structure; friable; medium acid; clear, smooth boundary. 5 to 8 inches thick.

B1—7 to 12 inches, yellowish-brown (10YR 5/4) cherty silty clay loam; weak, fine and medium, subangular blocky structure; friable; strongly acid; clear, smooth boundary. 3 to 8 inches thick.

B2—12 to 28 inches, yellowish-brown (10YR 5/4 to 5/6) cherty silty clay loam; weak, fine and medium, subangular blocky structure; firm; strongly acid; gradual, wavy boundary. 12 to 20 inches thick.

C—28 inches +, stratified layers of alluvial material including beds of chert, gravel, sand, and clay; the colors are dominantly light brown or yellow; friable; strongly acid; several feet thick in places.

The color of the Ap horizon ranges to dark grayish brown (10YR 4/2). In some profiles there is a thin, yellowish-brown (10YR 5/6) A3 horizon that has weak, fine and medium, angular blocky structure. The color of the B1 horizon ranges to strong brown (7.5YR 5/6). The B2 horizon, in some profiles, is strong brown (7.5YR 5/6 to 5/8) and has strong, medium, angular blocky structure. The depth to stratified alluvium and the thickness of the B2 horizon are variable. In the shallow Humphreys soil, the depth to the C horizon is approximately 20 inches in most places, and bedrock is at a depth of 2 or more feet. In the profiles of the steeper soils, the B2 horizon is underlain by a B3 horizon consisting of variegated reddish-brown (5YR 4/4), yellowish-red (5YR 4/6), and light yellowish-brown (10YR 6/4) cherty silty clay. This B3 horizon is firm and has strong, medium and coarse, angular blocky structure. It contains a few patchy clay films and numerous black concretions. This B3 horizon is underlain by variegated yellowish-red (5YR 5/6), brownish-yellow (10YR 6/6), and light olive-brown (2.5Y 5/4) silty clay that is firm, has strong, medium and coarse, angular blocky structure, and contains numerous small, black concretions. In some profiles the C horizon is underlain by acid, gray clay shale at a depth of about 25 inches.

Mountview series.—The Mountview series consists of well-drained, strongly acid soils of the uplands. The profile of these soils has moderately strong development. The soils are gently sloping to strongly sloping. They developed in part from loess, or in material that resembles loess, that overlies material weathered from cherty limestone. The Mountview soils have a less reddish, more silty, less clayey, and more friable B horizon than the Cookeville and Christian soils. They also have a different parent material than those soils. Mountview silt loam is the only soil type of this series recognized in the county. Some of the soil areas are shallow, and, in these, bedrock or cherty clay is at a depth of approximately 20 inches. Where the underlying material is bedrock, there is a thin, mottled layer in many places just above the bedrock. The following describes a profile of an uneroded sloping Mountview silt loam in a cultivated area:

Ap—0 to 7 inches, light yellowish-brown (10YR 6/4) silt loam; weak, fine, granular structure; friable; strongly acid; clear, smooth boundary. 5 to 9 inches thick.

B1—7 to 11 inches, light yellowish-brown (10YR 6/4) to pale-brown (10YR 6/3) silt loam; weak, fine and medium, subangular blocky structure; friable; strongly acid; clear, smooth boundary. 3 to 5 inches thick.

B2—11 to 26 inches, yellowish-brown (10YR 5/6 to 5/8) silty clay loam with few, fine, faint mottles of light gray (2.5Y 7/2) and pale yellow (2.5Y 7/4); moderate medium, subangular blocky structure; friable; soft, dark-brown concretions are common; gray coatings of silt are on the faces of individual peds; few soft fragments of weathered sandstone are in the lower part of horizon; strongly acid; gradual, wavy boundary. 13 to 18 inches thick.

B3—26 to 34 inches, yellowish-brown (10YR 5/7 to 5/8) silty clay loam with few, medium, distinct mottles of light gray (2.5Y 7/2) and pale yellow (2.5Y 7/4); weak to moderate, medium, subangular blocky structure; firm; chert fragments and irregularly shaped, dark-brown concretions are numerous; strongly acid; clear, wavy boundary. 6 to 10 inches thick.

C—34 inches +, variegated yellowish-red (5YR 4/6 to 4/8), yellowish-brown (10YR 5/6 to 5/8), light-gray (2.5Y 7/2), and pale-olive (5Y 6/2) cherty clay; moderate, fine and medium, angular blocky structure; firm; a few soft fragments of weathered sandstone are present; chert fragments are larger and more numerous with increasing depth; strongly acid.

The color of the Ap horizon ranges to grayish brown (2.5Y 5/2), and that of the B3 horizon, to yellowish red (5YR 4/6 to 4/8). The texture of the B2 horizon is silt loam. The thickness of the solum and the content of chert in the B2 horizon and in the lower horizons varies. In places the upper part of the C horizon has characteristics similar to those of a buried B horizon. In the shallow Mountview areas, the A and B horizons are thinner than those in the profile described. These shallow areas are underlain by a C horizon that is comparable to the one in the profile described, or they are underlain by bedrock, which is at a depth of approximately 20 inches.

Needmore series.—The Needmore series consists of well-drained, strongly acid soils of the uplands. These soils have moderately developed horizons. They developed chiefly in material weathered from acid to weakly calcareous shale, but they have a component of limestone and sandstone material in places. These soils have a shallower profile, are more brownish and less red, and contain more shale and less limestone and sandstone in their parent material than the Christian, Cookeville, and Talbott soils. Needmore silt loam, Needmore silty clay loam, and Needmore silty clay are the soil types of this series recognized

in Adair County. The Needmore silty clay loams are eroded, and the Needmore silty clays are severely eroded. The following describes a profile of a sloping Needmore silt loam in a cultivated area:

Ap—0 to 7 inches, brown (10YR 5/3) silt loam; weak, fine, granular and weak, medium, subangular blocky structure; friable; strongly acid; clear, smooth boundary. 5 to 8 inches thick.

B2—7 to 14 inches, strong-brown (7.5YR 5/8) clay; strong, medium and coarse, angular blocky structure; firm when moist, slightly sticky when wet, hard when dry; clay films are prominent on the faces of peds; strongly acid; clear, smooth boundary. 6 to 12 inches thick.

B3—14 to 18 inches, variegated yellowish-red (5YR 5/8), strong-brown (7.5YR 5/8), and yellowish-brown (10 YR 5/6) clay; moderate, medium and coarse, angular blocky structure; firm when moist, sticky when wet, hard when dry; very strongly acid; gradual, wavy boundary. 3 to 8 inches thick.

C—18 to 30 inches, variegated light olive-brown (2.5Y 5/4), olive (5Y 5/3), strong-brown (7.5YR 5/6), and yellowish-brown (10YR 5/8) clay; massive; firm; fragments of shale abundant; strongly acid. 6 to 12 inches thick.

Dr—30 inches +, weathered, weakly calcareous shale.

In places the Ap horizon is dark grayish brown (2.5Y 4/2). In some places the B2 horizon is yellowish brown (10YR 5/6), and in a very few places it is light olive brown (2.5Y 5/4). The B3 horizon is absent in some profiles. In places there is a small amount of chert in the profile, and in other places there are a few fragments of fine-grained sandstone throughout the profile.

Talbott series.—The Talbott series consists of well-drained, strongly acid, sloping to moderately steep soils of the uplands. These soils developed in material weathered from fine-grained limestone. Their subsoil is more clayey and is firmer and more plastic than those of the other soils in the Red-Yellow Podzolic great soil group. Talbott silt loam and Talbott very rocky silt loam are two soil types of this series recognized in Adair County. In addition, there are Talbott very rocky silty clays in severely eroded areas. The following describes a profile of a sloping, eroded Talbott silt loam in a cultivated area:

Ap—0 to 7 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine, granular structure; friable; medium acid; clear, smooth boundary. 6 to 8 inches thick.

B2—7 to 24 inches, yellowish-red (5YR 5/6) clay; few, fine, faint variegations of light brownish gray (10YR 6/2) that become more conspicuous with increasing depth; strong, medium, angular blocky structure; very firm when moist, very hard when dry, very sticky when wet; noticeable clay films on the faces of peds; strongly acid; gradual, smooth boundary. 7 to 14 inches thick.

B3—24 to 36 inches, yellowish-red (5YR 5/8) clay with medium, distinct variegations of brownish yellow (10YR 6/6) and light gray (10YR 7/2); very firm when moist, very hard when dry, very sticky when wet; strong, medium, angular blocky structure; strongly acid; gradual, smooth boundary. 7 to 14 inches thick.

C—36 to 48 inches +, variegated red (2.5YR 4/6), reddish-yellow (7.5YR 6/8), and light brownish-gray (10YR 6/2) clay; variegations are many, medium, and distinct; massive; very firm when moist, very hard when dry, very sticky when wet; strongly acid. 1 to 5 feet or more thick.

The A2 horizon ranges to brown (10YR 4/3) and pale brown (10YR 6/3). In places there is a thin, B1 horizon of yellowish-red silty clay loam. The depth to bedrock ranges from 3 to 10 feet or more, and in some places the profile is shallower over bedrock than that described. From 10 to 25 percent of the surface area of the very rocky Talbott soils is covered by outcrops of limestone, and there are occasional rock outcrops on the nonrocky soils.

Captina series.—The Captina series consists of moderately well drained, strongly acid soils that have a fragipan. These soils are gently sloping and are on stream terraces. They developed in alluvium, which washed chiefly from soils of limestone origin but contains an admixture of materials washed from soils of sandstone and shale origin. The following describes a profile of a Captina silt loam, the only soil type of this series recognized in Adair County, as it occurs in a cultivated area:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; medium to strongly acid; clear, smooth boundary. 6 to 8 inches thick.

B1—7 to 12 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine and medium, subangular blocky structure; friable; a few fragments of chert are scattered throughout the profile; strongly acid; clear, smooth boundary. 2 to 6 inches thick.

B2—12 to 26 inches, yellowish-brown (10YR 5/4 to 5/6) silty clay loam with a few, fine, faint mottles of pale olive (5Y 6/3 to 6/4) and splotches of strong brown (7.5YR 5/6 to 5/8); moderate, medium, subangular blocky structure; firm; very strongly acid; gradual, wavy boundary. 12 to 16 inches thick.

B3m—26 to 36 inches, yellowish-brown (10YR 5/4 to 5/6) silt loam with splotches and streaks of pale olive (5Y 6/3) and strong brown (7.5YR 5/6 to 5/8); moderate, coarse, angular blocky and thin, platy structure; firm; brittle and compact; very strongly acid; clear, smooth boundary. 8 to 12 inches thick.

C—36 inches +, variegated light olive-gray (5Y 6/2), strong-brown (7.5YR 5/6 to 5/8), and light yellowish-brown (2.5Y 6/4) silty clay that contains numerous fragments of chert; very strongly acid.

The depth, thickness, and characteristics of the C horizon are extremely variable. The texture and the amount of sand, gravel, and fragments of chert vary.

Dickson series.—The Dickson series consists of moderately well drained or well drained, strongly acid soils that have a fragipan. These soils are gently sloping and are on uplands. They developed in part from loess or in material resembling loess that overlies cherty material weathered from limestone. The Dickson soils resemble the Sango soils, to some extent, but they are slightly better drained. Their A horizon is less grayish than that of the Sango soils, and their B horizon is more brownish, less yellowish, less friable, and slightly more clayey. The following describes a profile of a gently sloping Dickson silt loam, the only soil type of this series recognized in Adair County, as it occurs in a cultivated area:

Ap—0 to 7 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; medium acid; clear, smooth boundary. 4 to 8 inches thick.

B1—7 to 11 inches, yellowish-brown (10YR 5/4) silt loam; weak, fine and medium, subangular blocky structure; friable; strongly acid; clear, wavy boundary. 3 to 5 inches thick.

B2—11 to 26 inches, yellowish-brown (10YR 5/6 to 5/8) silty clay loam; few, fine, faint mottles of light brownish gray (10YR 6/2); moderate, medium, subangular blocky structure; friable; strongly acid; clear, smooth boundary. 11 to 18 inches thick.

B3m—26 to 34 inches, yellowish-brown (10YR 5/6 to 5/8) silty clay loam; many, medium, distinct mottles of light brownish gray (2.5Y 6/2) and strong brown (7.5YR 5/6 to 5/8); moderate, fine, subangular blocky struc-

ture; firm, brittle and compact; strongly acid; gradual, wavy boundary. 6 to 12 inches thick.

C—34 inches +, variegated yellowish red (5YR 4/6 to 4/8), pale-yellow (5Y 7/3), and light-gray (5Y 7/2) silty clay; strong, medium and coarse, angular blocky structure; firm, strongly acid.

The color of the Ap horizon ranges to dark brown (10YR 4/3) or dark grayish brown (10YR 4/2); the color of the B2 horizon ranges to strong brown (7.5YR 5/6) and that of the B3m horizon, to strong brown. In places there is a layer below the B3m horizon that resembles a buried B horizon. It is variegated red (2.5YR 5/6), light yellowish brown (10YR 6/4), and pale brown (10YR 6/3). The texture of the B horizon is fine sandy clay loam in places. The Dickson soils in the northwestern part of the county have reddish-brown and reddish-yellow mottles in the B3m horizon. In places there are quartz pebbles and some particles of sand throughout the profile.

Landisburg series.—The Landisburg series consists of moderately well drained, strongly acid soils that have a fragipan. These soils are nearly level to strongly sloping and are on stream terraces, foot slopes, and fans. They developed in alluvium or colluvium, or both, that washed or rolled from soils of limestone, sandstone, and shale origin. Landisburg cherty silt loam and Landisburg silt loam are the soil types of this series recognized in Adair County. The following describes a profile of a sloping Landisburg cherty silt loam in a cultivated area:

Ap—0 to 8 inches, brown (10YR 5/3) cherty silt loam; weak, fine, granular structure; friable; strongly acid; clear, smooth boundary. 4 to 10 inches thick.

B1—8 to 13 inches, yellowish-brown (10YR 5/4 to 5/6) cherty silty clay loam; weak, fine and medium, subangular blocky structure; friable; strongly acid; gradual, smooth boundary. 4 to 6 inches thick.

B2—13 to 24 inches, yellowish-brown (10YR 5/4 to 5/8) cherty silty clay loam with few, fine, faint mottles of light brownish gray (2.5Y 6/2); weak to moderate, medium subangular blocky structure; firm; very strongly acid; clear, wavy boundary. 9 to 15 inches thick.

B3m—24 to 36 inches, mottled yellowish-brown (10YR 5/6), light olive-brown (2.5Y 5/4), and yellowish-red (5YR 5/8) cherty silt loam; moderate, medium, angular blocky structure; firm, brittle, and compact; very strongly acid; gradual, wavy boundary. 8 to 20 inches thick.

C—36 inches +, yellowish-red (5YR 4/6) cherty silty clay loam; common, medium, distinct mottles of light brownish gray (2.5Y 6/2); no definite structure; firm; very strongly acid.

The color of the Ap horizon ranges to light yellowish brown (10YR 6/4), grayish brown (2.5Y 5/2), or dark grayish brown (10YR 4/2). In places the color of the B1 horizon is brown (10YR 5/3), light olive brown (2.5Y 5/4), or light yellowish brown (10YR 6/4). The B2 horizon in some areas is light brownish gray, and it ranges to silt loam in texture. The C horizon varies in color and in composition. The Landisburg cherty silt loams have a large amount of chert throughout the profile, and the non-cherty Landisburg soils have a considerable amount of chert in the lower horizons. The thickness and the degree of compactness of the B3m horizon vary. In places the B3m horizon is primarily a partly cemented layer of chert. Seepage spots are common in these soils, especially in the sloping areas.

Sango series.—The Sango series consists of moderately well drained, strongly acid soils that have a fragipan. These soils are nearly level to gently sloping and are on uplands. They developed in a mantle of loess or in material that resembles loess that overlies cherty limestone. These soils resemble the Dickson soils to some extent, but they are slightly less well drained. In addition, their A horizon is more grayish than that of the Dickson soils; their B horizon is more grayish, more yellowish, and less brownish, and it is also more friable and less clayey. The following describes a profile of a gently sloping Sango silt loam, the only soil type of this series recognized in Adair County, as it occurs in a cultivated area:

Ap—0 to 6 inches, grayish-brown (2.5Y 5/2) silt loam; weak, fine, granular structure; very friable; strongly acid; clear, smooth boundary. 4 to 7 inches thick.

A2—6 to 9 inches, light yellowish-brown (2.5 6/4) silt loam; weak, fine, granular structure; very friable; strongly acid; clear, smooth boundary. 2 to 4 inches thick.

B1—9 to 13 inches, light yellowish-brown (2.5Y 6/4) silt loam; weak to moderate, fine, subangular and angular blocky structure; friable; a coating of gray silt appears on individual peds; strongly acid; clear, smooth boundary. 3 to 5 inches thick.

B2—13 to 27 inches, light yellowish-brown (2.5Y 6/4 to 10YR 6/4) silt loam; moderate, fine and medium, angular and subangular blocky structure; friable; strongly acid; gradual, wavy boundary. 8 to 12 inches thick.

B3m—27 to 38 inches, light olive-brown (2.5Y 6/6) or pale-brown (10YR 6/3) silt loam with common, medium, distinct mottles of gray, pale yellow, and brown; massive or weak, fine and medium, angular blocky structure; firm, brittle, and compact; very strongly acid; gradual, wavy boundary. 7 to 14 inches thick.

C—38 inches +, material weathered from cherty limestone and chert beds that contain yellowish-red, yellowish-brown, and gray silty clay loam and silty clay materials; strongly acid. 3 to 10 or more feet thick.

The color of the Ap horizon ranges to dark grayish brown (10YR 4/2). In places the texture of the B2 horizon is silty clay loam, and in places there is a thin A3 horizon. The depth to the pan ranges from 20 to 30 inches. The lower part of the profile has a platy structure in places, and the color and composition of the C horizon vary.

Etowah series.—The Etowah series consists of well-drained, medium acid or strongly acid, gently sloping to sloping soils on stream terraces. These soils developed in old alluvium washed chiefly from soils of limestone origin, but in places their parent material contains some material of sandstone and shale origin. These soils have a less well-defined A2 horizon than the other soils in this great soil group, and they more nearly represent the central concept of Red-Yellow Podzolic soils. The following describes a profile of a gently sloping Etowah silt loam, the only soil type of this series recognized in the county, as it occurs in a cultivated area:

Ap—0 to 7 inches, dark-brown (10YR 4/3 to 3/3) silt loam; weak, fine, granular structure; very friable; medium acid; clear, smooth boundary. 5 to 8 inches thick.

A2—7 to 15 inches, dark-brown (7.5YR 4/4 to 3/2) silt loam; weak, fine and medium, subangular blocky structure; friable; medium acid; clear, smooth boundary. 6 to 10 inches thick.

A3—15 to 20 inches, yellowish-red (5YR 4/6) silty clay loam; moderate, fine and medium, angular blocky structure; friable; strongly acid; clear, smooth boundary. 4 to 6 inches thick.

B1—20 to 29 inches, reddish-brown (5YR 4/4) silty clay loam; moderate, fine and medium, subangular blocky structure; firm; strongly acid; clear, smooth boundary. 7 to 10 inches thick.

B21—29 to 44 inches, yellowish-red (5YR 4/6) silty clay; moderate, medium and coarse, angular blocky structure; firm; strongly acid; gradual, wavy boundary. 12 to 18 inches thick.

B22—44 to 64 inches, dark-red (2.5YR 3/6) silty clay; strong, medium and coarse, angular blocky structure; clay films are prominent on the faces of peds; firm; numerous, small, dark reddish-brown (5YR 3/2 to 2/2) concretions; strongly acid; gradual, wavy boundary. 18 to 22 inches thick.

B3—64 inches +, variegated red or dark-red (2.5YR 5/8 to 3/6) and strong-brown (7.5YR 5/8) silty clay; medium, angular blocky structure; firm when moist, hard when dry, sticky when wet; strongly acid.

The thickness of the alluvium ranges from about 3 to 13 feet. Well-defined A3 and B1 horizons are lacking in some profiles. In places the A3 horizon is reddish brown (5YR 4/4), the B21 horizon is dark red (2.5YR 3/6), and the B22 horizon has a texture of heavy silty clay loam.

Pembroke series.—The Pembroke series consists of well-drained, medium acid soils of the uplands. These soils developed mainly in material weathered from limestone, but their parent material contained a small amount of loess or of material that resembles loess. The soils are gently sloping to sloping. They are more brownish and less yellowish throughout the profile than is characteristic of the Red-Yellow Podzolic soils. The following describes a profile of a gently sloping Pembroke silt loam, the only soil type of this series recognized in this county, as it occurs in a cultivated area:

Ap—0 to 7 inches, dark-brown (7.5YR 3/2) silt loam; weak, fine, granular structure; very friable; medium acid; clear, smooth boundary. 5 to 9 inches thick.

B1—7 to 11 inches, reddish-brown (5YR 4/4) light silty clay loam; weak, fine and medium, subangular blocky structure; friable; medium acid; clear, smooth boundary. 3 to 5 inches thick.

B21—11 to 23 inches, dark reddish-brown (5YR 3/4) silty clay loam; weak, fine and medium, subangular blocky structure; friable; contains a few, small, dark reddish-brown (5YR 3/2 to 3/3) concretions and very finely divided fragments of chert; medium acid; gradual, smooth boundary. 10 to 14 inches thick.

B22—23 to 38 inches, reddish-brown (2.5YR 4/4 to 4/6) silty clay with streaks of yellowish brown (10YR 5/6 to 5/8); moderate, medium, angular blocky structure; firm; contains numerous dark reddish-brown (5YR 3/3 to 3/4) concretions and few very finely divided fragments of chert; medium acid; gradual, smooth boundary. 10 to 30 inches thick.

B3—38 inches +, dark-red (2.5YR 3/6) silty clay with streaks and splotches of light yellowish brown (10YR 6/4); moderate, medium, angular blocky structure; firm; large, dark reddish-brown, irregularly shaped concretions and very finely divided fragments of chert are scattered throughout the profile; medium acid.

In places the Ap horizon is brown (7.5YR 4/4); the B1, B21, and B22 horizons are yellowish red (5YR 4/6); and the B3 horizon is dark reddish brown (2.5YR 3/4). The depth to bedrock varies, but it is at a depth of 8 to 10 feet in most places.

Caneyville series.—The Caneyville series consists of Red-Yellow Podzolic soils that intergrade toward Lithosols. The soils are well drained to somewhat excessively drained, medium to strongly acid, and moderately steep to steep. These soils are on the uplands, and they developed in material weathered from limestone and thin-bedded sandstone and shale. The texture of the Caneyville soils was not classified, and the only Caneyville mapping units in the county are Caneyville very rocky soils. In these soils the texture of the A horizon ranges from silt loam to fine sandy loam in areas that are not severely eroded, but it is sandy clay or silty clay in severely eroded areas. The B horizons are fairly thin and are not well defined, which is somewhat characteristic of the Lithosols. The following describes a profile of an eroded, moderately steep Caneyville very rocky silt loam, in a cultivated field:

Ap—0 to 6 inches, dark yellowish-brown (10YR 4/3) very rocky silt loam; weak, fine, granular structure; medium acid; clear, smooth boundary. 5 to 8 inches thick.

B2—6 to 20 inches, yellowish-red (5YR 5/6) silty clay; strong, medium, angular blocky structure; firm when moist, hard when dry, sticky when wet; thin, patchy clay films; few fragments of weathered sandstone; strongly acid; clear, wavy boundary. 10 to 20 inches thick.

B3—20 to 25 inches, yellowish-red (5YR 5/6) clay with common, medium, distinct variegations of strong brown (7.5YR 5/6); weak, medium, angular blocky structure; firm when moist, hard when dry, sticky when wet; strongly acid; clear, wavy boundary. 4 to 8 inches thick.

C—25 to 40 inches, variegated yellowish-red (5YR 5/6) and brownish-yellow (10YR 6/6) clay; variegations are many, fine, and distinct; hard when dry, firm when moist, sticky when wet; few dark concretions and fragments of weathered sandstone; medium acid; gradual, wavy boundary. 10 to 30 inches thick.

Dr—40 inches +, weathered limestone.

The depth to bedrock ranges from 2½ to 6 feet. In places there is a thin B1 horizon of yellowish-brown silty clay loam. In places the B2 horizon is strong brown (7.5YR 5/6). The content of sand throughout the profile varies, and the texture of the B2 horizon ranges from clay to sandy clay loam within short distances. Generally, a few fragments of weathered sandstone and chert are on the surface.

Intrazonal soils

The intrazonal soils have evident, genetically related horizons that reflect a dominant influence of topography or parent material over the effects of climate and plant and animal life. Only about 5 percent of the acreage in the county consists of intrazonal soils. The great soil groups in this order are the Humic Gley soils, Low-Humic Gley soils, and Planosols.

HUMIC GLEY SOILS

The Humic Gley soils have a dark organic-mineral surface layer that overlies a grayish or bluish horizon. They formed in low areas where slack water has accumulated, and they are poorly drained or very poorly drained. In this county only the Dunning series is in this great soil group.

Dunning series.—The Dunning series consists of poorly drained, dark-colored, neutral soils of the first bottoms. These soils developed in alluvium washed from fine-textured soils of limestone origin. They are in low, nearly flat areas or in slight depressions. The following describes a profile of a Dunning silt loam, the only soil type of this series recognized in Adair County, as it occurs in a cultivated area:

A11p—0 to 6 inches, very dark grayish-brown (10YR 3/2) silt loam with splotches of black (10YR 2/1) where the texture is silty clay loam; moderate, fine, granular structure; firm; neutral; abrupt, smooth boundary. 5 to 7 inches thick.

A12—6 to 18 inches, black (10YR 2/1) heavy silty clay loam; moderate, fine, granular to fine, subangular blocky structure; very firm; neutral; clear, smooth boundary. 10 to 15 inches thick.

Cg1—18 to 36 inches, grayish-brown (2.5Y 5/2) clay; many, fine, distinct reddish-yellow (7.5YR 6/6) mottles, which are more pronounced with increasing depth; few, faint, fine, black (10YR 2/1) mottles; massive; very firm; neutral; gradual, smooth boundary. 10 to 25 inches thick.

Cg2—36 to 48 inches +, mottled, light olive-brown (2.5Y 5/6) and dark grayish-brown (2.5Y 4/2) silty clay; mottles are many, medium, and distinct; massive; very firm; common, small reddish-brown concretions; neutral.

Thickness of the Cg1 horizon ranges from 10 to 25 inches within fairly short distances. In places there are mottles of yellowish brown or yellowish red. In some places there is a thin, more recently deposited layer on the surface, and the layer is more grayish and is slightly coarser textured than that described in the profile.

LOW-HUMIC GLEY SOILS

The Low-Humic Gley soils have a thin, light-colored Ap horizon over a gray, brown, and olive gleyed horizon. They have a weakly developed profile, and their horizons differ little in texture. These soils are somewhat poorly drained or poorly drained. Only the Melvin series is in the Low-Humic Gley great soil group.

Melvin series.—The Melvin series consists of poorly drained, slightly acid soils of the flood plains. These soils have very weak horizonation. They developed in alluvium that washed mainly from soils of limestone origin, but that contains a smaller amount of material from shale and sandstone. These soils are in low-lying, nearly level areas or in slight depressions in the flood plains. The following describes a profile of Melvin silt loam, the only soil type of this series recognized in the county, as it occurs in a cultivated area:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam with few, fine, faint, mottles of strong brown (7.5YR 5/6 to 5/8); weak, fine, granular structure; friable; slightly acid; clear, smooth boundary. 6 to 9 inches thick.

Cg1—8 to 18 inches, light olive-gray (5Y 6/2) silt loam with common, medium, distinct mottles and splotches of strong brown (7.5YR 5/6 to 5/8), olive gray (5Y 5/2), and pale olive (5Y 6/3 to 6/4); weak, fine, granular structure; friable; slightly acid; gradual, smooth boundary. 8 to 12 inches thick.

Cg2—18 inches +, mottled, light olive-gray (5Y 6/2), strong-brown (7.5YR 5/6), and pale-olive (5Y 6/3 to 6/4) silt loam; no definite structure; friable; slightly acid.

The color of the Ap horizon ranges to grayish brown (2.5Y 5/2), and that horizon is more highly mottled in places than the one in the profile described. The Cg1 horizon is silty clay loam in places. The composition of the Cg2 layer is variable. There are thin layers of chert fragments, gravel, and sand, or a mixture of those components, in many places.

PLANOSOLS

The soils in this great soil group are somewhat poorly drained or poorly drained. They have a leached A horizon and a highly developed B horizon. The B horizon is cemented and compacted, and the lower part contains a large amount of clay. The Guthrie, Lawrence, Robertsville, and Taft soils are in this great soil group. Descriptions of these soil series are given in the following pages.

Guthrie series.—The Guthrie series consists of poorly drained, strongly acid soils that have a fragipan. The soils are on flats and in depressions in the uplands. They developed partly in loess or in material that resembles loess and partly in material weathered from limestone. The following describes a profile of Guthrie silt loam, the only soil type of this series recognized in the county, as it occurs in a wooded area:

A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, fine, granular structure; friable; strongly acid; clear, smooth boundary. ½ inch to 2½ inches thick.

A2—2 to 6 inches, light brownish-gray (2.5Y 6/2) silt loam with few, fine, distinct mottles of strong brown (7.5YR 5/6 to 5/8); weak, fine, granular structure; friable; very strongly acid; clear, smooth boundary. 3 to 5 inches thick.

B2g—6 to 17 inches, light grayish-brown (2.5Y 6/2) silty clay loam with many, medium, distinct mottles of strong brown (7.5YR 5/6 to 5/8) and few, fine, faint mottles of olive gray (5Y 6/2); weak, fine, subangular blocky structure; firm; very strongly acid; gradual, smooth boundary. 9 to 13 inches thick.

B3m1—17 to 45 inches, mottled, strong-brown (7.5YR 5/6 to 5/8), light brownish-gray (2.5Y 6/2), and gray (5Y 6/2) silty clay; moderate, very coarse, angular blocky and thin, platy structure; very firm; very strongly acid; gradual, smooth boundary. 20 to 35 inches thick.

B3m2—45 inches +, mottled, gray (5Y 6/1), strong-brown (7.5YR 5/6 to 5/8), and olive-gray (5Y 5/2) silty clay; massive; very firm; fragments of chert are numerous; strongly acid.

In some places the profile is more grayish throughout than the one described, and the upper part is more mottled. The texture of the B3m1 horizon is silty clay loam in places. In many places the soil material in the B3m2 horizon grades toward a more yellowish and reddish, cherty C horizon. The depth to bedrock ranges from 4 to 10 feet or more. Depth to the fragipan is variable. The fragipan is at a somewhat greater depth in places than in the profile described, especially in the slight depressions.

Lawrence series.—The Lawrence series consists of somewhat poorly drained, strongly acid soils that have a fragipan. These soils are on flats in the uplands. They developed partly in loess or in material that resembles loess and partly in material weathered from limestone. The Lawrence soils differ from the Guthrie soils, chiefly in degree of drainage. They have more brownish or yellowish colors throughout the profile, less mottling in the upper part of the subsoil, and are better drained than the Guthrie soils. The following describes a profile of a Lawrence silt loam, the only soil type of the Lawrence series recognized in this county, as it occurs in a cultivated field:

Ap—0 to 6 inches, grayish-brown (2.5Y 5/2) silt loam; weak, fine, granular structure; friable; strongly acid; clear, smooth boundary. 5 to 7 inches thick.

A2—6 to 9 inches, light yellowish-brown (2.5Y 6/4) silt loam; few, fine, distinct mottles of brownish yellow (10YR 6/6); weak, fine, granular structure; friable; strongly acid; clear, smooth boundary. 2 to 5 inches thick.

B2—9 to 22 inches, pale-yellow (2.5Y 7/4) silt loam; many, medium, distinct mottles of brownish yellow (10YR 6/8) and light gray (2.5Y 7/2); moderate, medium, subangular blocky structure; firm; strongly acid; gradual, smooth boundary. 9 to 16 inches thick.

B3m—22 to 40 inches, mottled, light brownish-gray (2.5Y 6/2), light olive-brown (2.5Y 5/6), and pale-brown (10YR 6/3) silty clay loam; moderate, fine and medium,

angular blocky structure; firm, brittle, and compact; few, small, dark-brown concretions and fragments of chert; strongly acid; gradual, wavy boundary. 14 to 22 inches thick.

C—40 to 78 inches +, mottled, light yellowish-brown (2.5Y 6/2), strong-brown (7.5YR 5/6 to 5/8), and light-gray (5Y 7/2) silty clay; moderate, fine and medium, subangular blocky structure; firm; contains numerous fragments of chert and soft, dark-brown concretions; medium acid.

In some places the profile is more brownish or yellowish than the one described, and the upper part of the subsoil is less mottled. The C horizon in some places contains yellowish-red (5YR 4/6 to 4/8) cherty clay, and in other places it contains smooth, light brownish-gray (2.5Y 6/2) silty clay.

Robertsville series.—The Robertsville series consists of poorly drained, strongly acid soils that have a fragipan. These soils are in nearly level areas or in slight depressions on stream terraces. They developed in alluvium that washed chiefly from soils of limestone origin but that contains some material from soils of sandstone and shale origin. The following describes a profile of Robertsville silt loam, the only soil type of this series recognized and mapped in the county, as it occurs in a cultivated area:

Ap—0 to 5 inches, grayish-brown (2.5YR 5/2) silt loam; common, medium, distinct mottles of yellowish brown (10YR 5/4); weak, fine, granular structure; friable; strongly acid; clear, smooth boundary. 4 to 6 inches thick.

A2—5 to 14 inches, mottled, light olive-gray (5Y 6/2) and olive-yellow (2.5Y 6/6) silt loam; mottles are many, medium, and distinct; weak, medium, angular blocky structure; friable; strongly acid; clear, smooth boundary. 6 to 12 inches thick.

B3m—14 to 40 inches, mottled, light-gray (5Y 7/2), yellowish-brown (10YR 5/6), and pale-olive (5Y 6/3) silty clay loam; weak, medium, angular blocky structure; firm, brittle, and compact; few, small, dark-brown concretions and a few pebbles; strongly acid; gradual, wavy boundary. 15 to 30 inches thick.

C—40 inches +, light-gray (5Y 7/2) silty clay loam; many, coarse, prominent mottles of strong brown (7.5YR 5/6) and pale olive (5Y 6/3); weak, medium, angular blocky structure to massive; firm; few, small, dark-brown concretions and a few pebbles; very strongly acid.

The thickness and firmness of the A2 horizon and the amount of chert throughout the profile vary. In some places an additional layer that has characteristics of a Bg horizon with relict B2 clay pockets occurs between the A2 and B3m horizons. In places the Ap horizon is more grayish than that in the profile described. The depth to the B3m horizon varies, and this horizon is at a depth of 30 inches or more in some places.

Taft series.—The Taft series consists of somewhat poorly drained, strongly acid soils that have a fragipan. These soils are nearly level or level and are on stream terraces. They developed in alluvium washed mainly from soils of limestone origin. The Taft soils differ from the Robertsville soils, chiefly in degree of drainage. They are better drained than the Robertsville soils, and the upper part of the solum is less grayish and less mottled. The following describes a profile of Taft silt loam, the only soil type of this series recognized in this county, as it occurs in a cultivated area:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) silt loam; weak, fine, granular structure; friable; dark stains from organic matter are common; strongly acid; clear, smooth boundary. 6 to 10 inches thick.

B2—8 to 15 inches, pale-olive (5Y 6/3 to 6/4) silty clay loam with few, fine, faint mottles of light olive gray (5Y 6/2) and strong brown (7.5YR 5/6 to 5/8); weak, fine and medium, subangular blocky structure; friable; strongly acid; gradual, wavy boundary. 6 to 10 inches thick.

B3m—15 to 40 inches, olive-gray (5Y 6/2) silty clay loam with common, medium, distinct mottles of strong brown (7.5YR 5/6 to 5/8) and yellowish brown (10YR 5/6 to 5/8); thin, platy and moderate, fine, angular blocky structure; firm, brittle, and compact; contains waterworn gravel and fragments of chert; strongly acid; gradual, wavy boundary. 20 to 40 inches thick.

C—40 inches +, chiefly stratified gravel, fragments of chert, and sand; some silty clay mottled with gray and brown.

The color of the surface layer ranges from light olive gray (5Y 6/2) to dark grayish brown (10YR 4/2), and that of the B2 horizon ranges from yellowish brown (10YR 5/6 to 5/8) to pale olive (5Y 6/4). In many places the C horizon contains more clayey material and less gravel and chert than that in the profile described. The fragipan is at a greater depth in some profiles than in the profile described, and it is less compact in others. A few areas are cherty.

Azonal soils

The azonal soils lack distinct, genetically related horizons because of their youth, the condition of the parent material, or steep topography. About 17 percent of the county is occupied by azonal soils. The great soil groups in this order are the Alluvial soils, the Lithosols, and the Regosols.

ALLUVIAL SOILS

The Alluvial soils developed in alluvium that was recently transported and deposited. The original material has been changed little or none by the soil-forming processes, and there is little difference in texture throughout the profile. The Bruno, Huntington, Lindside, and Staser series represent the central concept of the Alluvial soils. The Newark soils intergrade toward Low-Humic Gley soils. Descriptions of these series follow.

Bruno series.—The Bruno series consists of excessively drained, medium or strongly acid soils of the flood plains. The soils developed in alluvium washed from soils of sandstone and siltstone origin. Their profile is sandy throughout. The following describes a profile of Bruno loamy fine sand, the only soil type of this series recognized in Adair County, as it occurs in a cultivated field:

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) loamy fine sand; weak to very weak, fine, granular structure; very loose or very friable; strongly acid; diffuse, smooth boundary. 6 to 10 inches thick.

C1—9 to 28 inches, dark grayish-brown (10YR 4/2) loamy sand; very weak, fine, granular structure; very loose or very friable; very strongly acid; gradual, smooth boundary. 15 to 30 inches thick.

C2—28 to 40 inches +, light-gray, stratified sand and gravel.

In places the C1 horizon contains gravel. In some places the depth to the C2 horizon is considerably greater than that in the profile described.

Huntington series.—The Huntington series consists of well-drained, neutral or slightly acid soils of the flood plains. The soils developed in alluvium washed chiefly from soils of limestone origin, but partly from soils of sandstone and shale origin. Huntington silt loam, Hunt-

ington fine sandy loam, and Huntington gravelly loam are the soil types of this series recognized in the county.

The profile of the Huntington fine sandy loams contains more sand throughout than that of the Huntington silt loams, and the C2 horizon is mainly of sandy and gravelly alluvium. The Huntington gravelly loams also have more sand throughout the profile than the Huntington silt loams, and they are slightly more acid. In addition, they contain a large amount of gravel; the soil material in the profile grades to gravelly and sandy material at a depth of approximately 25 inches. The Ap horizon is also more grayish than that of the Huntington silt loams, and the C1 horizon has a few strong-brown and pale-olive mottles in places. The following describes a profile of a Huntington silt loam in a cultivated area:

Ap—0 to 10 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; slightly acid; gradual, smooth boundary. 8 to 12 inches thick.

C1—10 to 30 inches, dark yellowish-brown (10YR 4/4) silt loam; weak to moderate, medium, granular structure; friable; slightly acid or neutral; gradual, smooth boundary. 15 to 25 inches thick.

C2—30 inches +, dark yellowish-brown (10YR 4/4) silt loam with stratified fine sandy loam and sandy loam; few, fine, faint, pale-olive (5Y 6/3) mottles; friable; slightly acid; 4 or more feet thick.

The texture of the C2 horizon varies. In places the depth to the stratified material is greater than that in the profile described. In some places the soil material is medium acid throughout the profile.

Lindside series.—The Lindside series consists of moderately well drained, slightly or medium acid soils of the flood plains. The soils developed in alluvium washed chiefly from soils of limestone origin, but partly from soils of sandstone and shale origin. Their parent material is similar to that of the Huntington soils, but they are less well drained and have a mottled C horizon. The following describes a profile of a Lindside silt loam, the only soil type of this series recognized in the county, as it occurs in a cultivated area:

Ap—0 to 8 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; slightly acid; gradual, smooth boundary. 6 to 10 inches thick.

C1—8 to 18 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; medium acid; gradual, smooth boundary. 6 to 18 inches thick.

C2—18 to 30 inches, dark grayish-brown (10YR 4/2) silt loam with common, medium, distinct mottles of grayish brown (2.5Y 5/2); weak, fine, granular structure; friable; few dark-brown concretions; medium acid; gradual, smooth boundary. 12 to 18 inches thick.

C3—30 inches +, silt loam or silty clay loam stratified with alluvium; mottled brown, pale brown, and gray; friable to firm; medium acid.

In places the color of the Ap and C1 horizons ranges to dark grayish brown, and the color of the C2 horizon ranges to brown. The C1 horizon is thicker in some places than that in the profile described, and the C2 horizon is more highly mottled.

Staser series.—The Staser series consists of well-drained, slightly acid soils of the flood plains. The soils developed in alluvium washed from soils of limestone, sandstone, and shale origin. They are similar to the Huntington soils, but they have a higher component of material from shale, and their profile is more grayish throughout.

Staser silt loam, Staser loam, and Staser gravelly loam are the soil types of this series recognized in this county. The Staser loam and the Staser gravelly loam have more sand throughout their profile than the Staser silt loam, and they are generally shallower over stratified gravel and sand. The Staser gravelly loam also has a high content of gravel throughout the profile. The following describes a profile of Staser silt loam in a cultivated area:

Ap—0 to 10 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; slightly acid; gradual, smooth boundary. 8 to 10 inches thick.

C1—10 to 20 inches, dark grayish-brown (10YR 4/2 to 2.5Y 4/2) heavy silt loam or light silty clay loam; weak, fine, granular structure; friable; slightly acid; gradual, smooth boundary. 8 to 14 inches thick.

C2—20 inches +, grayish-brown (2.5Y 5/2) heavy silt loam; weak, fine, granular structure; friable; slightly acid.

The characteristics of the C2 horizon vary. Stratified sand and gravel, or a mixture of both, are present in many areas. In places the C2 horizon has a few mottles.

Newark series.—The Newark series consists of Alluvial soils that intergrade toward the Low-Humic Gley soils. The Newark soils are on first bottoms and are somewhat poorly drained and slightly acid. They developed in alluvium washed chiefly from soils of limestone origin, but partly from soils of sandstone and shale origin. They are not so well drained and contain fewer mottles than the Lindside soils, and they are better drained and have more mottles than the Melvin soils. The degree of mottling in the lower horizons is somewhat characteristic of the Low-Humic Gley soils.

Newark silt loam and Newark gravelly silt loam are the soil types of this series recognized in this county. The Newark gravelly silt loam has more gravel and sand throughout the profile than the Newark silt loam, and it is slightly more acid, has a more grayish Ap horizon, and is underlain by more gravelly and sandy stratified material. The following describes a profile of Newark silt loam in a cultivated field:

Ap—0 to 10 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; slightly acid; gradual, smooth boundary. 8 to 12 inches thick.

C1—10 to 18 inches, grayish-brown (10YR 5/2) silt loam with few, fine, faint mottles of light brownish gray (10YR 6/2); friable; slightly acid; gradual, smooth boundary. 6 to 10 inches thick.

C2g—18 to 28 inches, grayish-brown (2.5Y 5/2) silt loam with common, medium, distinct mottles of gray (10YR 5/1) and yellowish brown (10YR 5/4); essentially structureless; friable; few dark-brown concretions; slightly acid.

C3g—28 inches +, gray (10YR 5/1) silt loam with common, medium, distinct mottles of grayish brown (2.5Y 5/2) and yellowish brown (10YR 5/4); structureless; friable; common, small, dark-brown concretions; slightly acid.

In places the Ap horizon is grayish brown (10YR 5/2). The properties of the C3g horizon vary. Stratified gravel, fragments of chert, and sand occur at a depth of 2½ to 3 feet in some places. The C1 horizon, in some places, contains more mottles than that in the profile described. The reaction ranges to medium acid in some places.

LITHOSOLS

The Lithosols have an incomplete solum or no clearly expressed soil morphology. They consist of fragments of freshly and imperfectly weathered rock. Lithosols

have thin, weakly developed horizons. In most places they have soft or hard rocks near the surface. These soils are generally steep, and, as a result, geologic erosion is rapid. The soil material is lost almost as rapidly as it is deposited. Therefore, the processes of soil formation have not acted upon the material long enough for the soils to have genetic horizons. In this county the Colyer, Muskingum, and Rockcastle soils are representative of the central concept of Lithosols. These soils are described in the following pages.

Colyer series.—The Colyer series consists of somewhat excessively drained, strongly acid, strongly sloping to moderately steep soils of the uplands. The soils have thin, weakly developed horizons and an incomplete profile. They developed in material weathered from black, acid, highly fissile shale, and their texture is somewhat characteristic of the material from which they developed. The following describes a profile of a moderately steep Colyer shaly silt loam, the only soil type of this series recognized in the county, as it occurs in a wooded area:

A1—0 to 1 inch, very dark gray (5YR 3/1) shaly silt loam; weak, fine, granular structure; very friable; the content of organic matter is relatively high; strongly acid; clear, smooth boundary. 0 to 2 inches thick.

A2—1 to 11 inches, dark grayish-brown (10YR 4/2) heavy shaly silt loam; weak, fine, granular structure; very friable; strongly acid; gradual, smooth boundary. 6 to 12 inches thick.

C—11 to 18 inches, variegated brown (7.5YR 5/4), light brownish-gray (2.5Y 6/2), and yellowish-red (5YR 5/6) silty clay loam; weak, medium, angular blocky structure; friable; contains abundant fragments of weathered shale; very strongly acid; gradual, smooth boundary. 4 to 10 inches thick.

Dr—18 inches +, unweathered, black, highly fissile, acid shale.

The color of the A2 horizon ranges to reddish brown (5YR 5/4). In places erosion has removed the A1 horizon and most of the A2. In these areas the profile is shallower over shale bedrock and is more shaly than that described.

Muskingum series.—The Muskingum series consists of excessively drained, medium or strongly acid soils of the uplands. They have slopes of 18 to 30 percent. These soils have thin, weakly developed horizons and an incomplete profile. The Muskingum soils developed in material weathered from fine-grained, acid sandstone and siltstone. The following describes a profile of Muskingum very fine sandy loam, the only soil type of this series recognized in Adair County, as it occurs in a wooded, moderately steep area:

A1—0 to 1 inch, pale-brown (10YR 6/3) very fine sandy loam; weak, fine, granular structure; very friable; medium acid; clear, smooth boundary. 1 to 2 inches thick.

A2—1 to 8 inches, brown (10YR 5/3) to light yellowish-brown (10YR 6/4) very fine sandy loam; weak, fine and medium, subangular blocky structure; friable; few fragments of fine-grained sandstone; medium to strongly acid; clear, wavy boundary. 6 to 8 inches thick.

BC—8 to 23 inches, yellowish-brown (10YR 5/6) sandy clay loam; weak, medium, subangular blocky structure; firm; fragments of sandstone common, and number increases with increasing depth; few small geodes present; strongly acid; gradual, wavy boundary. 14 to 25 inches thick.

Dr—23 inches +, weathered, fine-grained sandstone and siltstone.

The depth to bedrock and the number of fragments of sandstone scattered throughout the profile vary. In places there are occasional outcrops of sandstone, and some fragments of sandstone on the surface.

Rockcastle series.—The Rockcastle series consists of excessively drained, strongly acid, strongly sloping to steep soils of the uplands. These soils have thin, weakly developed horizons and an incomplete profile. They developed in material weathered from grayish, acid clay shale. The following describes a profile of a moderately steep Rockcastle silt loam, the only soil type of this series recognized in the county, as it occurs in a wooded area:

A1—0 to 1 inch, very dark grayish-brown (10YR 3/2) silt loam; weak, fine, granular structure; friable; fairly high in organic matter; strongly acid; clear, smooth boundary. ½ inch to 1½ inches thick.

A2—1 to 6 inches, pale-olive (5Y 6/3) heavy silt loam with few, fine, faint mottles of olive gray (5Y 5/2) and strong brown (7.5YR 5/6); moderate, medium, subangular blocky structure; friable; contains numerous, finely divided fragments of soft shale; strongly acid; gradual, smooth boundary. 4 to 8 inches thick.

C—6 to 15 inches, olive-gray (5Y 5/2) shaly silty clay with many, medium, distinct mottles of strong brown (7.5YR 5/6), pale yellow (5Y 7/3 to 7/4), and light gray (5Y 7/2); moderate, medium and coarse, angular blocky structure; firm; fragments of shale become larger and more numerous with increasing depth; lower part of the horizon has manifestations of a platy structure; very strongly acid; gradual, wavy boundary. 8 to 12 inches thick.

Dr—15 inches +, gray, pale-olive, and bluish-gray, acid heavy clay shale.

The A2 and C horizons have a weak, platy structure in places. The color, texture, and depth of the individual horizons vary within a relatively short distance. In places large pieces of shale occur in the A2 horizon. Seepy spots occur in many places at the base of slopes, and in some areas there is a thin layer of soil creep that is cherty in places.

REGOSOLS

Regosols in this county developed in material from deeply weathered cherty limestone. They have few or no clearly expressed characteristics that result from the processes of soil development. The only Regosols in this county are the soils of the Bodine series, which represent the central concept of this great soil group. A description of this series follows.

Bodine series.—The Bodine series consists of excessively drained, strongly or very strongly acid, sloping to steep soils of the uplands. These soils are strongly leached. They developed in material weathered from cherty limestone. The cherty limestone parent material and the steep slope have retarded profile development in these soils. The following describes a profile of a strongly sloping Bodine cherty silt loam, the only soil type of this series recognized in the county, as it occurs in a cultivated area:

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) cherty silt loam; weak, fine, granular structure; friable; strongly acid; gradual, smooth boundary. 4 to 8 inches thick.

BC—6 to 18 inches, yellowish-brown (10YR 5/6 to 5/8) cherty silty clay loam with few, fine, distinct, light-gray (5Y 7/2) variegations (apparently silt coats); weak, fine and medium, subangular blocky structure; friable; fragments of chert with light-gray silt coats that become larger and more numerous with increasing depth; strongly acid; gradual, wavy boundary. 10 to 14 inches thick.

C—18 inches +, primarily chert beds or cherty rubble, but contains light yellowish-brown (10YR 6/4) silty clay loam; variegated with reddish brown (5YR 5/4) and strong brown (7.5YR 5/6); thin, pale-brown (10YR 6/3) coatings of silt on the faces of the chert; no definite structure; firm; strongly acid. 2 to 10 feet or more thick.

In places the C horizon is somewhat more reddish and more clayey than that in the profile described. The content of chert throughout the upper layers is variable, but generally these soils contain a large amount of chert. In wooded areas these soils have a thin, dark-colored A1 horizon and a pale-brown A2. These soils in some areas that have been cultivated are more eroded than the soil for which a profile was described, and they are commonly more cherty and have a more yellowish plow layer. In places there are occasional shallow gullies.

In the eastern part of Adair County, some areas of these soils are underlain at a depth of approximately 20 inches by massive siltstone, the interstices of which are filled with strong-brown (7.5YR 5/6), heavy silt loam. The texture of the soil material in these areas is dominantly silt loam throughout the profile. Irregularly shaped, hard pieces of chert, 6 to 15 inches in diameter, are scattered over the surface of these soils, but the coarse skeleton of these profiles consists chiefly of soft siltstone.

Chemical and Physical Characteristics of Soils

In tables 9 and 10 are some chemical and physical data for the soils of five soil series sampled in Adair County. The analyses were made by the Soil Survey Laboratory, Soil Conservation Service, Beltsville, Md., and by the Agricultural Experiment Station, Agronomy Department, University of Kentucky, Lexington, Ky.

The Kentucky Agricultural Experiment Station also conducted tests on the B2 horizon of two representative samples of Christian silt loam and on the C horizon of two representative samples of Westmoreland shaly silt loam to determine the mineral composition of the clay fraction of these samples. In the Christian samples mica was detected and kaolin and vermiculite were moderate and abundant. In the Westmoreland samples mica and vermiculite were moderate and kaolin was detected. In one sample chlorite was detected. The determinations were made by X-ray, differential thermal analysis, and chemical analysis.

General Nature of the County

This section gives general facts about Adair County. The history and development, geology, physiography, relief, and drainage are discussed in the following pages. In addition, the climate, vegetation, agriculture, and livestock are described. The statistics used are mainly from reports published by the U.S. Bureau of the Census.

History and Development

Perhaps the first white men to enter the part of Kentucky that is now Adair County came into the area in a party consisting of 30 or 40 men. The men, led by Col. James Knox, left Virginia in 1770. When they reached this area, they found an abundance of fresh water and what seemed to be an inexhaustible supply of game, including deer, bear, raccoon, and wild turkey. The men hunted and explored for approximately 2 years before they returned to Virginia. Because of the long period they had spent away from home, they were called "Long Hunters."

After the "Long Hunters" had left the area, other hunters and explorers came from time to time. Then, in 1789, an order was passed that gave all the land between the Green and Cumberland Rivers to the soldiers of the Continental Army. As a result of this order, a group of former soldiers and their families soon came into the area from various counties in Virginia. They were followed by other settlers, and eventually, several counties were formed. Adair County, named for Gen. John Adair, was formed in 1801 from land taken from Green County. Columbia was made the county seat.

When Adair County was created, the only roads were Indian trails. Since that time, however, Kentucky Highway Nos. 55, 61, 80, and 206 have formed a link between Adair County and trading centers in all directions. The nearest railroad is the Louisville and Nashville, which passes through Greensburg and Campbellsville, a distance of 20 miles from Columbia.

The early settlers were religious people, and their descendants have built many churches. There are 85 different congregations in the county. Six denominations are located in Columbia.

The county has a good school system. There are five consolidated grade schools and one consolidated high school. Lindsey-Wilson, a junior college, is located in Columbia. It is attended by students from many counties in Kentucky and from other States.

A new hospital recently constructed in Columbia now serves Adair County. The county also maintains a public health unit.

Postal service for the rural areas is conducted by 21 rural post offices. There are also 8 star routes, and 3 rural routes.

Geology

Adair County lies in the Eastern Pennyroyal physiographic region of Kentucky, a part of the Mississippian Plateau (*10*). It is underlain by sedimentary rocks of Devonian and Mississippian age. In the extreme northeastern part of the county is a small deposit of sandstone of unknown age, which appears to be composed of debris from the Pennsylvanian sandstone. A mantle of silt covers the uplands throughout the county. This mantle ranges from a thin film to a layer approximately 30 inches thick, but it is thicker and more extensive in the central and eastern parts of the county. It is believed that this silty material was transported by wind.

The Chattanooga black shale of the Devonian system is exposed along the more deeply entrenched streams. Resting upon the Chattanooga shale and comprising the lowest formation of Mississippian age is the New Providence gray clay shale. It ranges in thickness from 3 feet in the southern part of the county to 35 feet at points along the Green River. The Fort Payne formation, which is

TABLE 9.—*Chemical and physical*

Soil type and sample location	Horizon	Depth	Chemical characteristics: Exchangeable cations [2] Ca	Mg	K	Na	H	Sum
		Inches	*Meq./100 g. of soil*	*Meq./100 g. of soil*	*Meq./100 g. of soil*	*Meq./100 g. of soil*	*Meq/100 g. of soil*	*Meq./100 g. of soil*
Christian silt loam (field determination): Junction of State Highway Nos. 61 and 1012 near Sparksville.	Ap	0–6	5. 2	1. 1	0. 4	0. 4	1. 1	8. 2
	A2	6–15	4. 4	. 8	. 3	. 3	1. 7	7. 5
	B1	15–19	5. 6	1. 0	. 3	. 3	2. 7	9. 9
	B2	19–38	3. 4	2. 0	. 3	. 4	7. 9	14. 0
	B3	38–54	1. 1	1. 2	. 2	. 3	5. 4	8. 2
	C	54+	1. 0	. 9	. 1	. 1	7. 5	9. 6
Christian silt loam (field determination): 30 yds. SE. of Hopewell Baptist Church on Columbia-Bakerton Road.	Ap	0–6	2. 8	. 7	. 2	< . 1	8. 3	12. 0
	B1	6–12	9. 6	1. 2	. 4	. 2	6. 9	18. 3
	B2	12–28	6. 3	2. 0	. 4	. 2	11. 9	20. 8
	B3	28–35	2. 0	1. 1	. 3	. 2	17. 7	21. 3
	C	35+	. 5	. 5	. 2	. 2	19. 5	20. 9
Needmore silt loam: 1.1 mile N. of State Highway No. 80 on State Highway No. 531.	A1	0–2	10. 4	. 5	. 4	. 1	3. 6	15. 0
	A2	2–7	1. 6	. 2	. 1	. 1	6. 7	8. 7
	B2	7–17	. 8	. 1	. 1	. 3	12. 9	14. 2
	C	17–24	14. 6	. 6	. 3	. 4	10. 7	26. 6
	Dr	24+	19. 6	. 9	. 3	. 3	8. 4	29. 5
Needmore silt loam: 1 mile E. of Glens Fork on gravel road ½ mile N. of junction with State Highway No. 55.	A1	0–2	5. 4	< . 1	. 2	. 1	16. 1	21. 8
	A2	2–8	. 8	< . 1	. 1	. 2	8. 7	9. 8
	B2	8–18	1. 0	. 1	. 1	. 2	7. 5	8. 9
	C	18–26	1. 3	< . 1	. 1	. 2	10. 5	11. 6
	Dr	26+	1. 7	. 2	. 1	. 4	11. 8	14. 2
Westmoreland shaly silt loam: ½ mile S. of rock quarry, 2 miles N. of Columbia at junction of gravel roads.	A1	0–2	25. 9	. 9	. 5	. 1	2. 1	29. 5
	A2	2–8	5. 6	. 4	. 2	. 1	1. 3	7. 6
	C	8–20	1. 5	. 2	. 2	. 2	2. 1	4. 2
	[5] Dr	20+						
Westmoreland shaly silt loam: On gravel road 3 miles N. of junction with State Highway No. 55, located 2 miles E. of Glens Fork.	A1	0–3	39. 0	2. 1	. 5	. 1	12. 2	53. 9
	A2	3–11	1. 7	. 1	. 1	. 2	9. 4	11. 5
	C	11–18	12. 2	. 9	. 2	. 2	6. 7	20. 2
	D4	18+	20. 6	. 9	. 2	. 3	8. 4	30. 4

[1] Analyses by Soil Survey Laboratory, Soil Conservation Service, Beltsville, Md. All data are reported on an ovendry basis.

[2] Organic carbon and exchangeable cations were determined according to the methods described in USDA Bul. No. 757 (*11*). A 77 percent recovery factor was used for calculation of the percentage of organic carbon. The macro method was used for determination of exchangeable cations. The following deviations in procedure were made in determining exchangeable cations:

1. A 25-gram soil sample and 250 milliliters of ammonium acetate were used for leaching the soil in the extraction of cations.
2. A cerate titration for calcium was used rather than the permanganate method.
3. Sodium and potassium were determined by flame spectrophotometry.

approximately 250 feet thick and consists of limestone, shale, and sandstone, is above the New Providence gray clay shale. Limestone, thin-bedded sandstone, and shale of the Warsaw formation, which is 100 feet thick in places, are immediately above the Fort Payne formation. Cherty limestone of the St. Louis formation is on the high ridgetops; this formation is most extensive in the southern and western parts of the county.

A geologic cross section of the county and a discussion of the geology can be found in the section "Formation, Classification, and Morphology of Soils." The soil associations, which give a broad picture of the physiography of the area, are disccussed in the section "General Soil Map."

Relief and Drainage

The relief of the county ranges from nearly level to very steep and is closely related to the geologic formations and to the kinds of soils. The county is mainly on a dissected plateau. In the most dissected parts, the ridges rise from 400 to 490 feet above the valley floors. The highest point, located three-fourths of a mile north of Breeding, is 1,124 feet above sea level. The lowest points in the county are along the Green River, where it crosses the western boundary of the county, and at the southern boundary of the county, along Crocus Creek. Both of these points are 625 feet above sea level. The elevation in Columbia ranges from 720 feet along Russell Creek to 920 feet at the water tower. The elevation at the city square is 790 feet.

characteristics of some representative soils [1]

Physical characteristics													USDA textural class
			Size class and diameter of particles [4]										
Base saturation	Reaction [3]	Organic carbon [4]	Very coarse sand (2.0 to 1.0 mm.)	Coarse sand (1.0 to 0.5 mm.)	Medium sand (0.5 to 0.25 mm.)	Fine sand (0.25 to 0.1 mm.)	Very fine sand (0.1 to 0.05 mm.)	Silt (0.05 to 0.002 mm.)	Clay (<0.002 mm.)	0.2 to 0.02 mm.	0.02 to 0.002 mm.	>2 mm.	
Percent	*pH*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	
87	7. 0	1. 24	0. 4	0. 6	2. 1	28. 2	13. 2	38. 7	16. 8	47. 1	24. 0	0	Loam.
77	6. 7	. 89	. 2	. 5	1. 7	24. 6	12. 1	44. 2	16. 7	45. 0	28. 3	17	Loam.
73	6. 8	. 79	. 3	. 5	1. 7	20. 7	10. 2	40. 1	26. 5	36. 9	27. 7	<1	Loam or clay loam.
44	5. 0	. 43	. 1	. 3	1. 6	22. 4	11. 0	24. 3	40. 3	35. 2	15. 6	<1	Clay or clay loam.
34	4. 8	. 26	. 2	. 4	2. 3	32. 0	13. 2	20. 2	31. 7	43. 1	11. 7	<1	Sandy clay loam.
22	4. 8	. 20	. 2	. 6	2. 1	28. 8	13. 0	17. 2	38. 1	41. 1	9. 3	0	Clay loam or sandy clay.
31	5. 6	1. 24	2. 3	3. 9	4. 1	12. 6	15. 1	43. 5	18. 5	39. 7	28. 4	1	Loam.
62	5. 9	. 89	. 6	2. 1	2. 5	9. 3	11. 6	21. 2	52. 7	25. 2	15. 0	0	Clay.
43	5. 2	. 34	. 1	. 8	. 8	9. 0	19. 2	21. 8	48. 3	33. 4	15. 7	10	Clay.
17	5. 0	. 28	. 1	. 5	. 8	10. 0	20. 8	25. 3	42. 5	36. 7	18. 2	0	Clay.
7	4. 6	. 23	. 6	. 4	. 2	. 8	3. 1	46. 3	48. 6	17. 3	32. 7	0	Silty clay.
76	6. 8	2. 84	1. 4	2. 0	1. 2	2. 2	2. 0	77. 5	13. 7	29. 8	51. 1	<1	Silt loam.
23	4. 9	. 72	1. 1	1. 5	. 9	1. 6	1. 7	77. 9	15. 3	29. 5	51. 1	<1	Silt loam.
9	4. 5	. 39	. 5	. 7	. 5	. 8	. 8	68. 1	28. 6	18. 8	50. 7	<1	Silty clay loam.
60	5. 0	. 55	. 3	. 7	. 4	. 7	. 9	48. 5	48. 5	12. 7	37. 1	<1	Silty clay.
72	5. 3	. 35	. 5	1. 0	. 5	. 8	. 9	50. 6	45. 7	12. 8	39. 1	25	Silty clay.
26	4. 6	5. 1	3. 2	3. 2	1. 5	2. 3	2. 1	74. 1	13. 6	26. 1	51. 4	6	Silt loam.
11	4. 6	1. 29	2. 7	1. 5	. 7	1. 3	1. 7	76. 2	15. 9	24. 6	54. 1	6	Silt loam.
16	4. 7	. 45	1. 7	1. 2	. 6	1. 1	1. 8	71. 5	22. 1	23. 3	50. 8	6	Silt loam.
14	4. 7	. 32	1. 3	1. 0	. 5	1. 0	1. 6	69. 1	25. 5	21. 2	50. 1	5	Silt loam.
17	4. 6	. 27	1. 6	1. 8	. 8	1. 6	2. 5	63. 8	27. 9	20. 6	46. 6	30	Silty clay loam or silt loam.
93	7. 3	4. 6	7. 2	6. 1	3. 3	5. 4	3. 8	57. 6	16. 6	23. 8	40. 6	13	Silt loam.
83	6. 4	. 82	6. 0	4. 7	2. 5	4. 2	3. 9	60. 0	18. 7	21. 5	44. 8	24	Silt loam.
50	4. 8	. 43	6. 2	5. 6	2. 5	4. 0	4. 1	55. 8	21. 8	20. 5	41. 6	33	Silt loam.
77	6. 8	12. 5	6. 6	6. 3	3. 2	8. 3	6. 4	55. 6	13. 6	26. 5	40. 4	10	Silt loam.
18	4. 6	1. 03	5. 0	4. 2	2. 3	6. 0	4. 9	57. 2	20. 4	25. 2	40. 5	39	Silt loam.
67	5. 4	. 84	5. 8	4. 8	2. 2	4. 4	4. 7	35. 7	42. 4	17. 5	25. 5	16	Clay.
72	6. 9	. 98	7. 7	5. 8	2. 9	5. 4	4. 9	36. 0	37. 3	19. 1	24. 8	24	Clay loam.

[3] The reaction was determined by means of a Beckman pH meter using a glass electrode with a soil water ratio of 1:1 (1:5 if horizons were organic).

[4] The particle-size distribution analyses were made in accordance with the method described by V. J. Kilmer and L. T. Alexander in "Methods of Making Mechanical Analyses of Soils" (*7*) and in the method described by V. J. Kilmer and Joseph F. Mullins in "Improved Stirring and Pipetting Apparatus for Mechanical Analysis of Soils" (*8*).

[5] No analysis was made for this layer of shale.

The central part of the county is rolling, and there are local karst areas that are characterized by sinks and depressions. The east-central part of the county and a small area south of Columbia are composed of upland flats. Narrow ridgetops and deep, narrow valleys that have steep walls are characteristic of the southern and western parts. The northern part of the county consists of ridges that have narrow to moderately broad tops and of narrow valleys that have steep walls.

Two types of drainage, surface and subterranean, make up the natural drainage system in the county. Approximately 85 percent of the county is drained by surface drains. The areas of karst topography, which are underlain by cavernous limestone, are drained by a subterranean system. In the subterranean type of drainage, the water from surrounding higher areas accumulates in the depressions after each intensive rain. The depressions are drained by a natural outlet or by a tunnel that intersects a surface stream at a lower elevation. These natural outlets, commonly called sinkholes, range from 1 to 20 feet or more in diameter.

Occasionally, one of the outlets becomes clogged with particles of soil material, crop residues, or other debris that has been carried into it by the water from heavy rains. When this occurs, a number of hours, or even weeks, may be required for the water to filter down into the underground cavern. As a result, the depression is made unsuitable for cultivated crops. If the outlet becomes sealed

TABLE 10.—*Chemical and physical characteristics*

[Two sets of figures indicate

Soil type, sample location, and sample number	Horizon	Depth	Chemical characteristics		
			Exchangeable cations		
			Ca	Mg	K
		Inches	*Meq./100 g. of soil*	*Meq./100 g. of soil*	*Meq./100 g. of soil*
Cookeville silt loam: W. of Garlin Post Office on State Highway No. 206; site 5 (S54 Ky-1-5-1).	Ap	0–6	3. 4	0. 5	0. 3
	B1	6–13	1. 2	. 8	. 4
	B21	13–34	1. 4	1. 4	. 7
	B22	34–61	. 8	1. 3	. 4
	B3 or C	61–96	. 6	1. 2	. 5
Cookeville silt loam: 3.9 miles NE. of Columbia on gravel road off State Highway No. 206; site 6 (S54 Ky-1-6).	Ap	0–5	3. 4	. 4	. 1
	B1	5–17	2. 0	. 7	. 2
	B21	17–30	1. 3	1. 3	. 2
	B22	30–58	. 7	. 8	. 2
	B3	58–85	. 2	. 3	. 1
Sango silt loam: 3 miles NE. of junction of State Highway Nos. 206 and 531; site 1 (S54 Ky-1-1).	Ap	0–8	1. 7	. 2	. 2
	B1	8–13	. 9	. 1	. 1
	B2	13–23	1. 2	. 2	. 1
	B2m	23–30	. 7	. 3	. 2
	C	30–45	. 3	. 3	. 1
	Dr	45+	. 2	. 3	. 1
Sango silt loam: 8 miles E. of Columbia on State Highway 80; site 2 (S54 Ky-1-2).	A1+A2	0–8	. 3	. 1	. 1
	A3	8–12	. 3	. 1	. 1
	B2	12–26	. 3	. 2	. 1
	B2m	26–38	. 3	. 4	. 1
	C	38+	. 3	. 5	. 1
Sango silt loam: 1.6 miles SW. of Milltown; site 3 (S54 Ky-1-3-).	A1	0–5	5. 6	. 8	. 3
	A2	5–10	3. 4	. 4	. 1
	B1	10–15	2. 9	. 4	. 1
	B2	15–23	3. 8	. 4	. 2
	B2m	23–30	5. 6	1. 3	. 2
	C	30–38	6. 0	1. 8	. 2

See footnotes at end of table.

of some representative soils [1]
duplicate determinations]

Chemical characteristics—Continued: Exchangeable cations—Continued: Na	Exchangeable cations—Continued: Sum	Base saturation	pH[2]	Organic matter	P	Physical characteristics: Particle-size distribution [3]: Total sand	Silt (0.05 to 0.002 mm.)	Clay (0.002 mm.)	Textural class USDA
Meq./100 g. of soil	*Meq./100 g. of soil*	*Percent*		*Percent*	*p.p.m.*	*Percent*	*Percent*	*Percent*	
0.1	5.9	73	5.7	2.15	5.7	25.1 24.7	64.4 60.8	10.5 14.5	Silt loam.
.1	6.7	38	5.0	.95	5.7	20.5 20.0	58.2 55.3	21.3 24.7	Silt loam.
.3	12.0	32	4.7	.58	8.4	22.8 20.4	33.1 31.1	44.1 46.5	Clay.
.2	14.9	18	4.7	.25	3.8	20.7 21.3	22.2 18.7	57.1 60.0	Clay.
2.1	21.4	20	4.9	.18	4.5	7.5 9.7	31.5 24.3	61.0 66.0	Clay.
.1	7.8	51	6.0	1.54	6.8	23.5 23.9	60.5 76.1	16.0 0	Silt loam.
.1	10.6	28	5.3	.37	6.1	14.8 14.8	47.6 67.2	37.6 18.0	Silty clay loam. Silt loam.
.1	13.9	20	5.4	.17	7.2	14.7 15.2	41.6 59.1	43.7 25.7	Silty clay. Silt loam.
.1	12.3	14	5.5	.11	4.7	18.5 18.5	39.9 56.5	41.6 25.0	Clay. Silty clay.
.1	11.3	6	4.9	.04	6.1	24.8 25.2	36.7 54.7	38.5 20.1	Clay loam. Silt loam.
.1	4.8	45	5.3	1.69	3.0	26.1 21.1	64.0 69.0	9.9 9.9	Silt loam.
.2	5.0	26	5.0	.19	2.0	20.6 26.1	63.4 57.6	16.0 16.3	Silt loam.
.2	6.6	25	5.1	.17	1.0	18.6 18.1	61.4 62.9	20.0 19.0	Silty clay loam.
.2	7.0	19	4.9	.9	1.0	17.2 16.6	62.8 64.4	20.0 19.0	Silt loam.
.1	6.9	13	5.0	----------	2.0	15.7 15.9	64.3 67.9	20.0 16.2	Silt loam.
.1	6.4	10	5.0	----------	2.0	15.2 18.1	65.8 61.9	19.0 20.0	Silt loam.
.1	4.9	11	4.9	2.32	6.0	30.5 22.8	60.3 59.1	9.2 18.1	Silt loam.
.1	3.7	16	4.8	.53	4.0	29.2 29.6	59.5 60.0	11.3 10.4	Silt loam.
.1	4.8	17	4.9	.24	4.0	27.2 26.5	56.9 54.9	15.9 18.6	Silt loam.
.1	7.8	13	4.7	.20	4.0	22.7 21.9	57.3 58.5	20.0 19.6	Silt loam.
.2	8.2	14	4.8	.10	4.0	24.0 20.1	55.8 57.9	20.2 22.0	Silt loam.
.1	7.8	88	6.0	2.99	10.0	22.4 22.5	65.4 66.5	12.2 11.0	Silt loam.
.1	5.8	68	5.7	1.64	2.0	22.8 19.9	64.4 67.5	12.8 12.6	Silt loam.
.1	5.9	60	5.3	.19	4.0	18.4 16.6	63.3 62.1	18.3 21.3	Silt loam.
.1	7.3	62	5.2	.18	4.0	20.5 18.7	57.0 57.1	21.7 24.3	Silt loam.
.2	11.0	66	5.3	.13	4.0	20.5 18.4	52.7 51.1	26.8 30.5	Silt loam. Silty clay loam.
.2	10.1	80	6.2	.07	6.0	35.8 35.8	45.0 45.0	19.2 19.2	Loam.

TABLE 10.—*Chemical and physical characteristics*
[Two sets of figures indicate

Soil type, sample location, and sample number	Horizon	Depth	Chemical characteristics: Exchangeable cations		
			Ca	Mg	
Sango silt loam:					
3 miles SE. of Christine on State Highway No. 531; site 4 (S54 Ky-1-4).	Ap	0–9	5.0	0.5	0.1
	A3	9–15	2.9	.3	.1
	B2	15–28	1.7	.5	.1
	B2m	28–40	.4	.7	.2
	C	40+	.3	.5	.1

[1] Analyses by Agricultural Experiment Station, Department of Agronomy, University of Kentucky, Lexington, Ky.
[2] pH was determined with a pH meter in 1:1 water suspension.

tightly enough so that water does not filter down into the underground cavern, the depression is filled permanently with water and is commonly used as a farm pond.

The Green River, which meanders through the northern part of the county, has been allowed to silt in. Gravel bars have formed, and the capacity of the river channel has been so reduced that it will no longer carry the volume of water that results from heavy rainfall. A rise of only a few feet is needed to cause the river to overflow its banks, and then the water spreads over the flood plains. In places the river has formed a new channel, and it has left sloughs in some areas or there are low areas filled with water. These low-lying flood plains, which in some places are 1½ to 2 miles wide, make up a large acreage of wet soils.

Russell Creek, the second largest stream in the county, drains a large area of the better farming land in the central part. Flooding of this stream causes less damage to crops than flooding along the Green River.

The south-central part of the county, including a steep, wooded area of shallow soils, is drained by he headwaters of Crocus Creek. After each large rain, the creek overflows its banks and spreads over the rather narrow flood plain. Although the flood plains are occupied by fertile soils, heavy crop losses are inflicted when flooding occurs during the cropping season.

Other streams in the county that drain a large acreage are Crooked Creek, Casey Creek, Big Creek, Leatherwood Creek, White Oak Creek, Barnetts Creek, Spruce Pine Creek, Damron Creek, Caney Fork, Sulphur Creek, Butler Creek, Mill Creek, Little Clifty Creek, Cedar Creek, Grassy Creek, Harrods Fork, Prices Creek, Short Creek, and Disappointment Creek. Some of these are tributaries of the Green River, Russell Creek, and Crocus Creek.

Climate [5]

The climate of Adair County is generally temperate and healthful. It is well suited to many different plants and animals. The temperature is moderate during most of the year, but there are short periods of hot weather in summer and short periods of cold weather in winter. During about 45 days of an average year, the maximum temperature is 90° F. or higher. At times in the past, the temperature has been higher than 100° in June, July, August, and September. Now a temperature higher than 100° is relatively rare, and it generally occurs only once during an average year.

As is typical in the lower part of the Ohio Valley, the winters in Adair County are not unusually severe. Freezing temperatures occur on an average of about 85 days in winter. On about 15 of these days the temperature remains below freezing all day. Temperatures of below zero can be expected about once each winter. On most days in winter, the temperature rises above freezing during the day and falls below freezing at night. A constant freeze-thaw cycle is thus normal in winter.

The average length of the growing season, from the date of the last light freeze in spring to the first light freeze in fall, is 181 days. In 5 out of every 10 years, the growing season can be expected to be between 170 and 192 days long. In 8 out of every 10 years, a growing season of between 160 and 202 days in length can be expected.

Adair County has an average rainfall of approximately 49 inches annually. The moisture is sufficient for crops. Fall is generally the driest season, and spring is generally the wettest. During the fall, there are generally one or

[5] By O. K. ANDERSON, State climatologist, U.S. Weather Bureau, Louisville, Ky.

of some representative soils[1]—Continued

duplicate determinations

Chemical characteristics—Continued						Physical characteristics			
Exchangeable cations—Continued						Particle-size distribution[3]			
Na	Sum	Base saturation	pH[2]	Organic matter	P	Total sand	Silt (0.05 to 0.002 mm.)	Clay (0.002 mm.)	Textural class USDA
Meq./100 g. of soil	*Meq./100 g. of soil*	*Percent*		*Percent*	*p.p.m.*	*Percent*	*Percent*	*Percent*	
. 1	5. 9	95	7. 1	1. 90	8. 0	21. 2	69. 6	9. 2	Silt loam.
. 1	4. 8	69	6. 3	. 59	6. 0	17. 6	67. 0	15. 3	Silt loam.
. 1	7. 3	34	5. 1	. 34	4. 0	14. 3	63. 7	22. 0	Silt loam.
						14. 5	64. 7	20. 8	
. 1	8. 9	16	4. 7	. 24	4. 0	12. 0	63. 5	24. 5	Silt loam.
						12. 3	64. 2	23. 5	
. 1	7. 8	15	4. 7	. 23	4. 0	14. 4	62. 6	23. 0	Silt loam.
						14. 3	66. 2	19. 5	

[3] Particle-size analysis by hydrometer method. (Clay by hydrometer, sands by sieving, silts by subtracting the percentage of sand and clay from 100.) (*5*).

two long periods of mild, sunny weather when harvesting operations may proceed uninterrupted. On the average, there is measurable precipitation on about 124 days each year.

The average annual snowfall is 10.4 inches, but the ground seldom remains covered with snow for more than a few days. About five times each year, a snowfall of more than 1 inch can be expected.

Thunderstorms may occur during any month, but they are most frequent from March through September. They occur on an average of 50 days per year. Short periods of intensive rainfall are more frequent in summer than in winter. Normally, one storm per year produces 1.3 inches of rain in an hour. There is a 30 percent chance that such a storm will take place during the month of July, but less than 1 percent chance that rainfall of this intensity will occur during the months of November through January. In July, heavy storms only 1 hour long contribute to flooding, but a greater danger of flooding may come from a smaller amount of rain in winter, when the soil is frozen, saturated, or covered by snow. Once in 10 years, a 24-hour total of 4.40 inches of rain can be expected. The chance of this amount falling in July is about 5 percent, and in March, about 4 percent. The chance of this amount falling in the other months is much less.

Observations of relative humidity and wind are not available for Adair County. Records from other parts of the State indicate that the humidity in the early part of the morning ranges from 75 to 84 percent, and in the early part of the afternoon, from 56 to 73 percent. The higher humidity in the morning occurs from June through August, and the higher humidity in the afternoon occurs from December through February.

Winds are moderate most of the time, and their speed ranges from 7 to 12 miles per hour. The wind reaches its highest velocity during storms, especially during squalls that attend thunderstorms. Then the velocity ranges from 50 to 70 miles per hour and may occasionally exceed these amounts in gusts. There are 103 days on the average, when the sky is clear from sunrise to sunset; 107 days when it is partly cloudy; and 155 days when it is cloudy.

This range of rainfall, temperature, wind, humidity, and sunshine makes the climate of Adair County suitable for growing many different crops. The soils are generally wet throughout the winter and early in spring, but there are nearly always some periods when they are dry enough to till.

Table 11 shows, by months, the average, the average maximum, the average minimum, the absolute maximum, and the absolute minimum temperatures at Greensburg in Green County, Ky. These data are considered to be representative of those in Adair County. The table also gives the average, the maximum, and the minimum amount of rainfall in the month indicated; the maximum amount of rainfall in 1 day; and the average and maximum amount of snowfall.

The probable dates of the last freezing temperature in spring and the first in fall are given in table 12. The probability of a crop being damaged by frost can be estimated with the aid of this table. Generally, only the tenderest plants are killed in a light freeze. In a moderate freeze most plants are damaged to some extent, and most cultivated plants are damaged heavily in a severe freeze.

TABLE 11.—*Temperature and precipitation at Greensburg, Ky.*

Month	Temperature [1]					Precipitation					
	Average	Average maximum	Average minimum	Absolute maximum	Absolute minimum	Average [2]	Maximum [2]	Minimum [2]	Maximum in 1 day [2]	Average snowfall [3]	Maximum snowfall [3]
	°F.	°F.	°F.	°F.	°F.	In.	In.	In.	In.	In.	In.
January	36.0	46.9	25.1	82	−17	5.07	18.07	0.64	4.0	3.8	20.0
February	37.3	48.6	26.0	79	−29	3.79	12.35	.56	3.50	2.8	12.0
March	46.7	59.1	34.3	89	2	5.27	13.23	1.22	4.0	1.1	14.5
April	55.6	68.9	42.2	93	15	3.87	8.44	1.04	5.10	.1	3.0
May	65.0	78.3	51.7	99	27	4.37	8.73	.60	2.50		
June	73.4	86.2	60.7	107	37	4.63	13.76	.91	4.20		
July	76.8	89.5	64.1	114	42	4.22	9.92	.70	3.40		
August	75.6	88.3	62.8	110	42	4.12	10.28	1.23	3.50		
September	69.7	83.4	56.0	105	25	3.16	7.58	(4)	3.50		
October	57.7	72.1	43.2	96	17	2.85	8.84	.10	3.18	(4)	2.0
November	45.9	58.6	33.2	84	−3	3.59	7.95	.90	2.43	.4	4.4
December	37.1	47.7	26.5	73	−14	4.09	9.10	.52	3.65	2.2	14.0
Year	56.4	69.0	43.8	114	−29	49.03	18.07	(4)	5.10	10.4	20.0

[1] Based on a 74-year record.
[2] Based on a 63-year record.
[3] Based on a 58-year record.
[4] Trace.

TABLE 12.—*Probabilities of last freezing temperatures in spring and first in fall*

Probability	Dates for given probability and temperature		
	At least a light freeze (29° through 32° F.)	At least a moderate freeze (25° through 28° F.)	Severe freeze (24° F. or less)
Spring:			
1 year in 2 later than	April 22	April 6	March 22.
2 years in 10 later than	May 1	April 17	April 3.
1 year in 10 later than	May 7	April 23	April 9.
Fall:			
1 year in 2 earlier than	October 16	October 27	October 31.
2 years in 10 earlier than	October 6	October 18	October 20.
1 year in 10 later than	October 1	October 13	October 14.

Vegetation

The native vegetation of Adair County was predominantly deciduous trees, chiefly oaks and hickories. Vines and canes were common in open areas and along streams. Redcedar and Virginia pine were the only native conifers, and there were a few holly trees and magnolias, species of the broad-leaved evergreens, scattered over the county.

Much of the acreage has now been cleared and is used for cultivated crops and pasture, but some of the steeper areas have been replanted to trees. There are still a few large, wooded tracts in the county. A total of 65,974 acres, or about 31 percent of the total acreage of farmland, was in trees in 1959. In that year approximately 43 percent of the total land area of the county was wooded.

Agriculture

Little is known of the early agriculture of the Indians, but corn, beans, and pumpkins are believed to have been their chief crops. When the first white hunters and scouts arrived in the area that is now Adair County, they learned that the Iroquois Indians had set aside this area, called Ka-Ten-Tah-Teh, or Land of Tomorrow, as an exclusive hunting ground. Therefore, most of the agriculture of the smaller tribes was confined to a section just south of this county in the adjoining State.

When the white settlers arrived, they found a huge forest of hardwoods that were entangled with vines. The vines made it difficult to girdle the trees or to clear the land. The crops that were planted not only required cultivation, but they had to be kept under strict observation to prevent wild animals from destroying them.

Excellent yields were obtained on the soils for a period of 2 to 3 years, and then yields dropped off approximately one-half. As a result, the farmer had to clear new land. As the population increased, the huge hardwoods were cut and burned. Within a few years, little was left of the forests. Smoke rose from settlers' homes along the trails, and the rolling, cultivated fields spread over the countryside.

Farming has changed greatly since those early times. In 1959, 212,370 acres, or 84.4 percent of the land area of the county, was in farms. Of the land in farms, 123,045 acres was used for crops in 1959, 50,411 acres was land

from which crops were harvested, 54,092 acres was used only for pasture, and 18,542 acres was neither harvested nor pastured. In the same year, 65,974 acres was woodland on farms, a total of 11,394 acres was pastured woodland, and 54,580 acres was woodland not pastured.

The farms vary greatly in size, but the size of the average farm was 92.8 acres in 1959. Only 2 farms were larger than 1,000 acres, but 171 farms were smaller than 10 acres. More than half of the farms were between 10 acres and 100 acres in size.

The farm enterprises are diversified, and some of the crops and livestock products are used on the farm. In 1959, 817 of the 2,289 farms in the county were miscellaneous and unclassified. The rest were classified, as follows, according to the type of farm:

	Number of farms
Tobacco farms	800
Poultry farms	11
Dairy farms	260
Livestock farms other than poultry and dairy	191
General farms	210

Table 13 gives the acreage of the principal crops in stated years. Corn is the most important feed crop and is grown on nearly all the farms. In 1959, corn produced a larger yield on a smaller acreage than was produced in 1954. Hay crops, mainly lespedeza, mixed grasses and clover, and small grains are grown on most farms. Although the acreage of alfalfa is small, it has increased in recent years. Alfalfa is the most important hay crop on some dairy farms. Small grains are grown on many farms, but the acreage is less than that used for corn or hay. Wheat and oats comprise the largest acreage of the small grains, and the acreage of barley and rye is small. The small grains are used mostly for feed. Burley tobacco, the most important cash crop, is grown on a small acreage on nearly all farms.

TABLE 13.—*Acreage of the principal crops in stated years*

Crop	1954	1959
	Acres	*Acres*
Corn for all purposes	25, 918	21, 516
Sorghum for all purposes	[1] 352	184
Wheat harvested	1, 566	1, 240
Oats harvested	1, 361	487
Barley harvested	281	297
Rye harvested	21	8
Soybeans grown for all purposes	471	423
Land from which hay was cut	25, 035	24, 426
Alfalfa and alfalfa mixtures	462	683
Clover, timothy, and mixtures of clover and grasses	3, 409	4, 747
Lespedeza	15, 400	16, 432
Small grains	4, 048	1, 489
Other hay	1, 716	1, 075
Field seed crops harvested:		
Red clover	([2])	45
Lespedeza	115	120
Tall fescue	172	451
Orchardgrass	([2])	153
Irish potatoes harvested for home use or for sale	[3] 30	[3] 25
Burley tobacco harvested	2, 831	2, 127
Vegetables harvested for sale	8	12
Strawberries harvested for sale	5	8
Tree fruits, nuts, and grapes [4]	182	99

[1] Except harvested for sirup.
[2] Not reported.
[3] Does not include acreage for farms with less than 20 bushels harvested.
[4] Does not include data for farms with less than 20 trees and grapevines.

Livestock

The number of cattle and hogs in the county has increased during the past few years. Chickens were once raised extensively, but their number has declined. The number of milk cows increased slightly during the period from 1954 to 1959, but the income from sales of milk and cream more than doubled during the same period. The number of horses and mules has declined in recent years. The horses and mules are used mostly as work animals. Table 14 shows the number and kind of livestock in the county in 1954 and in 1959.

TABLE 14.—*Kind and number of livestock in stated years*

Livestock	1954	1959
	Number	*Number*
Cattle and calves	18, 577	22, 376
Milk cows	9, 540	9, 807
Horse and mules	3, 214	2, 018
Hogs and pigs	13, 626	18, 909
Sheep and lambs	1, 260	1, 224
Chickens [1]	109, 180	59, 694

[1] Four months old and older.

Glossary

Alluvium. Fine material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water-holding capacity. The difference between the amount of water in a soil at field capacity and the amount in the same soil at the permanent wilting point. Commonly expressed as inches of water per inch of soil.

Chert. A structureless form of silica, closely related to flint, which breaks into angular fragments. Soils developed from impure limestone containing fragments of chert and having abundant quantities of these fragments in the soil mass are called cherty soils.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose. Noncoherent; will not hold together in a mass.

Friable. When moist, crushes easily under gentle to moderate pressure between thumb and forefinger and can be pressed together into a lump.

Firm. When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic. When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a wire when rolled between thumb and forefinger.

Sticky. When wet, adheres to other material; tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard. When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft. When dry, breaks into powder or individual grains under very slight pressure.

Cemented. Hard and brittle; little affected by moistening.

Erosion, soil. The wearing away or removal of soil material by water or by wind. The following erosion classes are used in this report:

Class 1—Little or no erosion. The surface soil, or uppermost 7 inches, exhibits the properties of the A horizon. The present surface soil consists of all to 75 percent of the original material from the A horizon. These conditions prevail over 75 percent or more of the delineated area.

Class 2—Moderate erosion. The surface soil exhibits properties resulting from an intermixture of material from the A horizon and from the underlying horizons. The intermixture contains 25 to 75 percent of the original material from the A horizon. Seventy-five percent of the delineated area contains at least 25 percent of A horizon material in the surface soil. In places there are occasional shallow gullies.

Class 3—Severe erosion. The surface soil exhibits the properties of the layers beneath the A horizon. The present surface soil contains more than 75 percent of the material from horizons underlying the A horizon. Areas that have patches making up more than 25 percent of the delineated area in which the surface soil consists almost entirely of material from the underlying horizons are included in this class. In places there are shallow gullies in the delineated area.

Fragipan. A dense, brittle subsurface horizon very low in organic matter and clay but rich in silt or very fine sand. The layer seems to be cemented when it is dry, is hard or very hard, and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick. They are generally below the B horizon and 15 to 40 inches below the surface. See also Pan.

Gravel. Coarse mineral particles ranging from 2 millimeters to 3 inches in diameter. Fine gravel ranges from 2 millimeters to ½ inch in diameter.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. The A horizons make up a zone of illuviation, in which clay and other materials have accumulated. The A and B horizons, taken together, are called the solum, or true soil.

Infiltration. The downward entry of water into the immediate surface of a soil or other material, as contrasted with percolation, which is the movement of water through the soil layers or soil material.

Internal soil drainage. The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristics of the soil profile and underlying layers and by the height of the water table, either permanent or perched. Relative terms for expressing internal drainage are *none, very slow, slow, medium, rapid,* and *very rapid.*

Moisture-supplying capacity. The relative capacity of the soil to take in and supply moisture in amounts favorable to most plants. It is related to the amount of runoff, the rate of infiltration, the available water-holding capacity, the depth of the root zone, and the average moisture-extraction pattern. The relative moisture-supplying capacity is expressed as *very high, high, moderately high, moderately low, low, or very low.*

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are: *Fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Natural drainage. Refers to moisture conditions that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural drainage are recognized: *Excessively drained, somewhat excessively drained, well drained, moderately well drained, imperfectly or somewhat poorly drained, poorly drained, and very poorly drained.*

Organic matter. A general term for plant and animal material, in or on the soil, in all stages of decomposition. Readily decomposed organic matter is often distinguished from the more stable forms that are past the stage of rapid decomposition. The estimated amount represents approximately the following percentages by weight:

	Percent
Very low	Less than 0.8
Low	0.8 to 2
Moderate	2 to 3.5
High	More than 3.5

Pan. A layer in a soil that is firmly compacted or very rich in clay. Frequently the word "pan" is combined with other words that more explicitly indicate the nature of the layers; for example, *hardpan, fragipan,* and *claypan.*

Parent material (soil). The horizon of weathered rock or partly weathered soil material from which a soil has formed; horizon C in the soil profile.

Permeability, soil. The quality of a soil horizon that enables water or air to move through it. The following terms are used to describe permeability: *Very slow, slow, moderately slow, moderate, moderately rapid, rapid, and very rapid.*

Phase, soil. A subdivision of a soil type, series, or other unit in the soil classification system made because of differences in the soil that affect its management but that do not affect its classification in the natural landscape. A soil type, for example, may be divided into phases because of differences in slope, stoniness, thickness, or some other characteristic that affects management.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material. See also Horizon, soil.

Reaction, soil. The degree of acidity or alkalinity of a soil expressed in pH values. A soil that has a pH of 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. In words the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Mildly alkaline	7.4–7.8
Very strongly acid	4.5–5.0	Moderately alkaline	7.9–8.4
Strongly acid	5.1–5.5	Strongly alkaline	8.5–9.0
Medium acid	5.6–6.0	Very strongly alkaline	9.1 and higher
Slightly acid	6.1–6.5		
Neutral	6.6–7.3		

Relief. The elevations or inequalities of a land surface, considered collectively.

Root zone. The part of the soil that is penetrated or can be penetrated, by plant roots. The height of the water table, clay content, fragipan, and bedrock are features that limit the depth of the root zone. The following terms are used in this report to indicate the depth of the root zone:

	Inches
Very shallow	Less than 10
Shallow	10 to 20
Moderately deep	20 to 36
Deep	36 or more

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 millimeter to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Series, soil. A group of soils developed from a particular type of parent material and having genetic horizons that, except for the texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Slope. The amount of rise or fall in feet for each 100 feet of horizontal distance. It is normally expressed in percent. The terms used in this report are

	Percent
Nearly level	0 to 2
Gently sloping	2 to 6
Sloping	6 to 12
Strongly sloping	12 to 20
Moderately steep	20 to 30
Steep	30 to 55

Soil separates. Mineral particles, less than 2 millimeters in equivalent diameter and ranging between specified size limits. The following names and sizes of separates are recognized in the United States: *Very coarse sand* (2.0 to 1.0 millimeter), *coarse sand* (1.0 to 0.5 millimeter), *medium sand* (0.5 to 0.25 millimeter), *fine sand* (0.25 to 0.10 millimeter), *very fine sand* (0.10 to 0.05 millimeter), *silt* (0.05 to 0.002 millimeter), and clay (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soils consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying parent material. The living roots and the plants and animals that live in the soils are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are *platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. Structureless soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the profile below plow depth.

Substratum. Any layer beneath the solum, or true soil; the C or D horizon.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace. An embankment or ridge constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surplus runoff so that it may soak into the soil or flow slowly to a prepared outlet without harm. Terraces in fields are generally built so that they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. Stream terraces are frequently called *second bottoms*, as contrasted to *flood plains*, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The following are the basic textural classes, in order of increasing proportions of fine particles: Sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine." See also Clay; Sand; Silt.

Topsoil. Presumably fertile soil or soil material, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Type, soil. A subdivision of the soil series that is made on the basis of differences in the texture of the surface layer.

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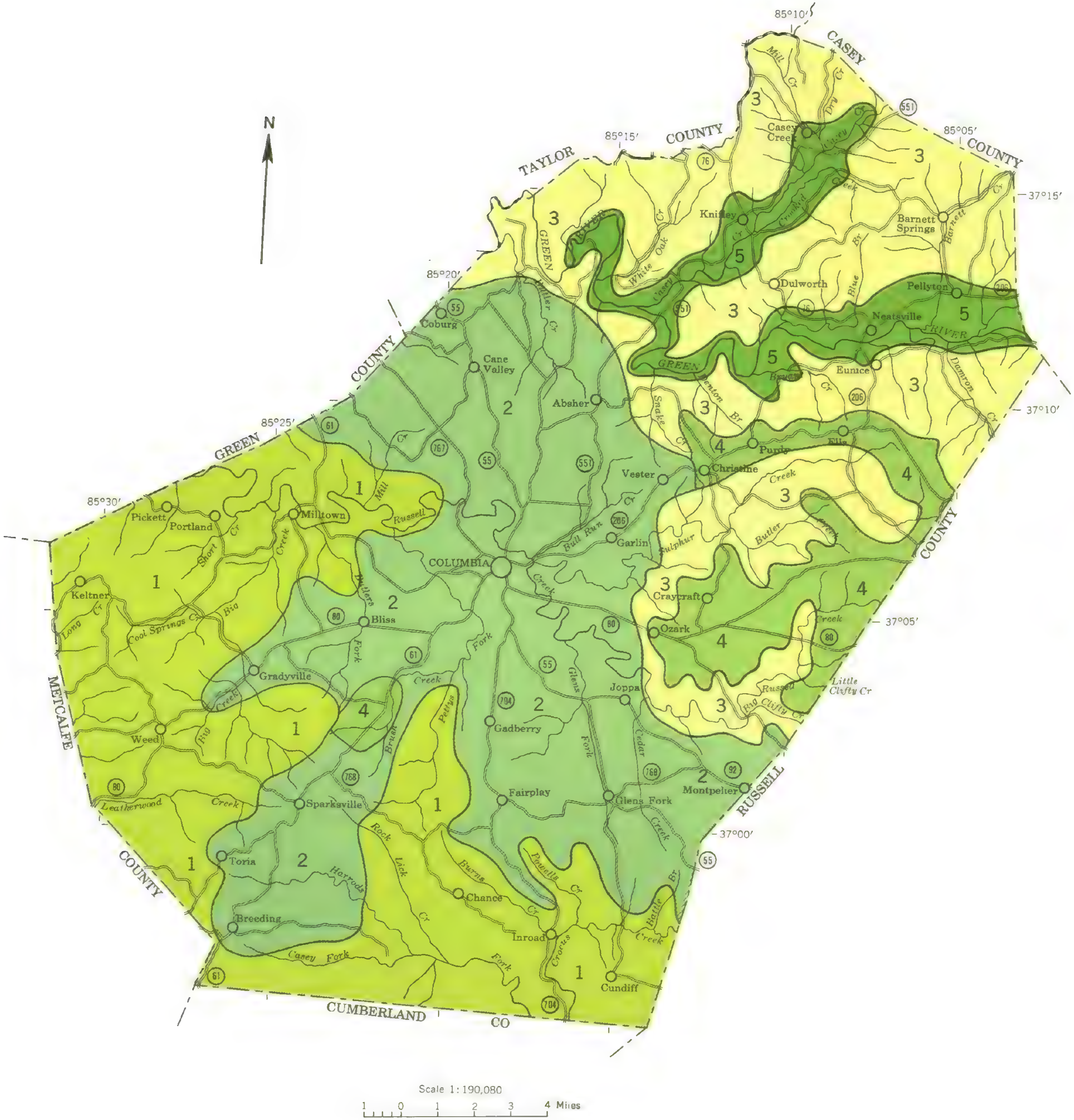
GENERAL SOIL MAP
ADAIR COUNTY, KENTUCKY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
KENTUCKY AGRICULTURAL EXPERIMENT STATION



SOIL ASSOCIATIONS

1 Westmoreland-Caneyville-Baxter association: Dominantly steep, well-drained or somewhat excessively drained soils that have a clayey subsoil and are on dissected uplands

2 Baxter-Christian-Bewleyville association: Rolling, dominantly well-drained soils that have a deep root zone and a clayey subsoil and are on broad uplands

3 Frankstown-Bodine-Westmoreland association: Deep, sloping, well-drained, cherty soils on ridgetops, and shallow, steep, somewhat excessively drained or excessively drained soils on hillsides

4 Sango-Mountview-Lawrence association: Soils of nearly level to sloping, broad ridgetops; somewhat poorly drained or moderately well drained soils that have a pan, and deep, well-drained soils

5 Staser-Taft-Landisburg association: Somewhat poorly drained to well-drained soils on nearly level flood plains and on gently sloping to sloping stream terraces and foot slopes

May 1963

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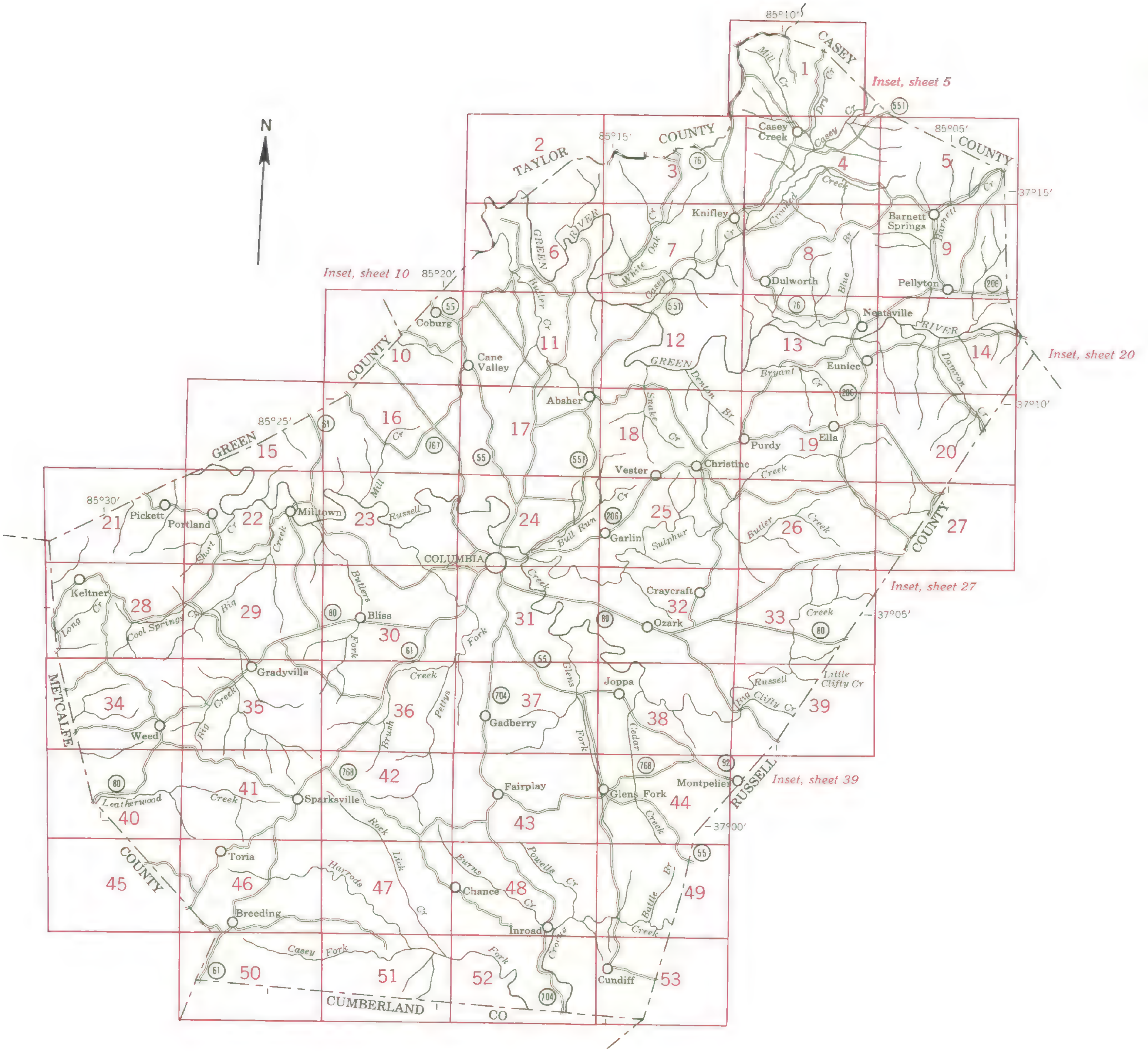
ADAIR COUNTY, KENTUCKY



N

This map is one of a set compiled in 1962 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Kentucky Agricultural Experiment Station.

(Joins inset, sheet 5)

(Joins sheet 3) | (Joins sheet 4)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

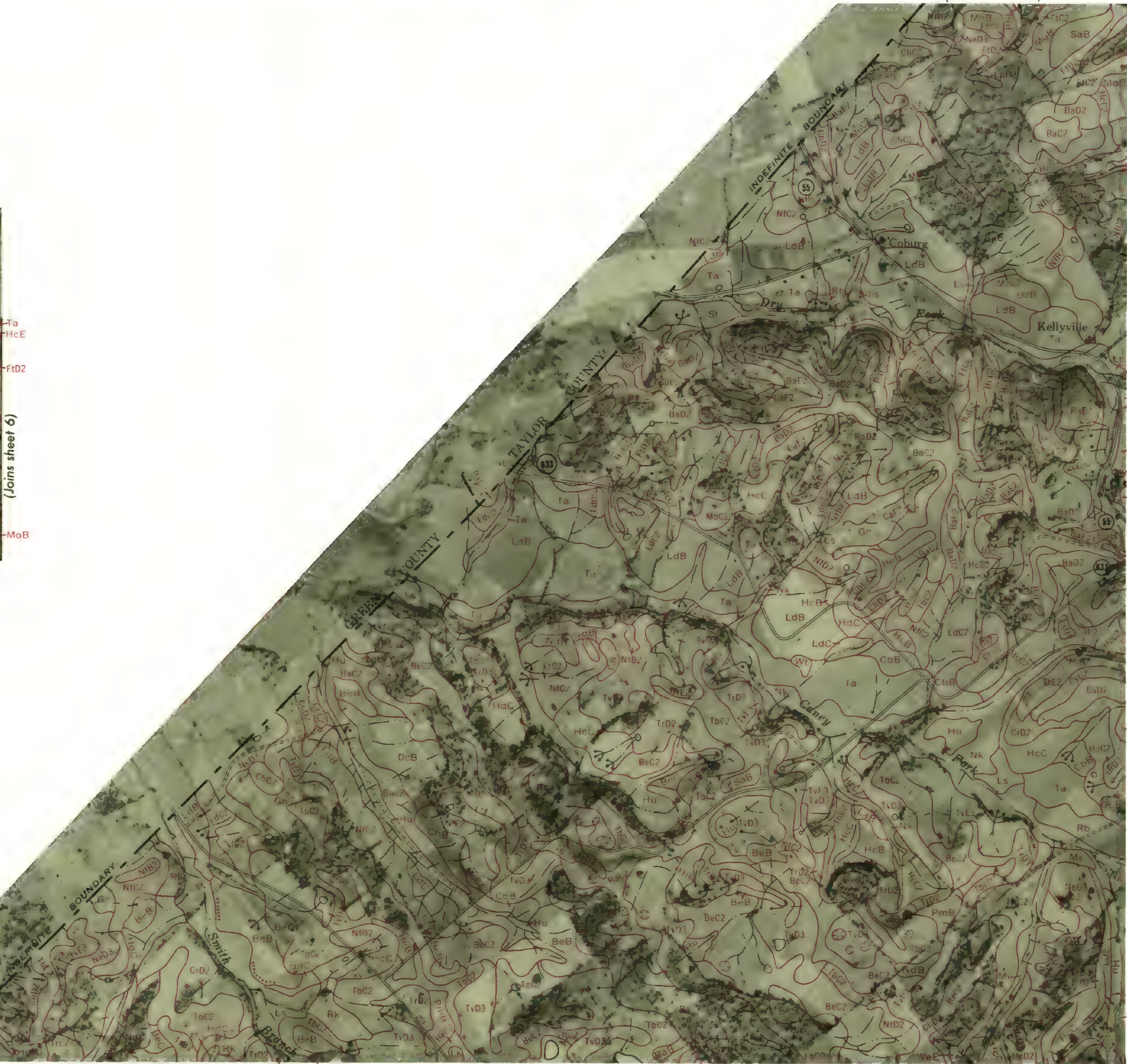
(10)

N

(Joins sheet 6)

(Joins upper right)

(Joins lower left)



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(Joins sheet 16)

CrD2 TvD3 TbC2 MuE NfD2

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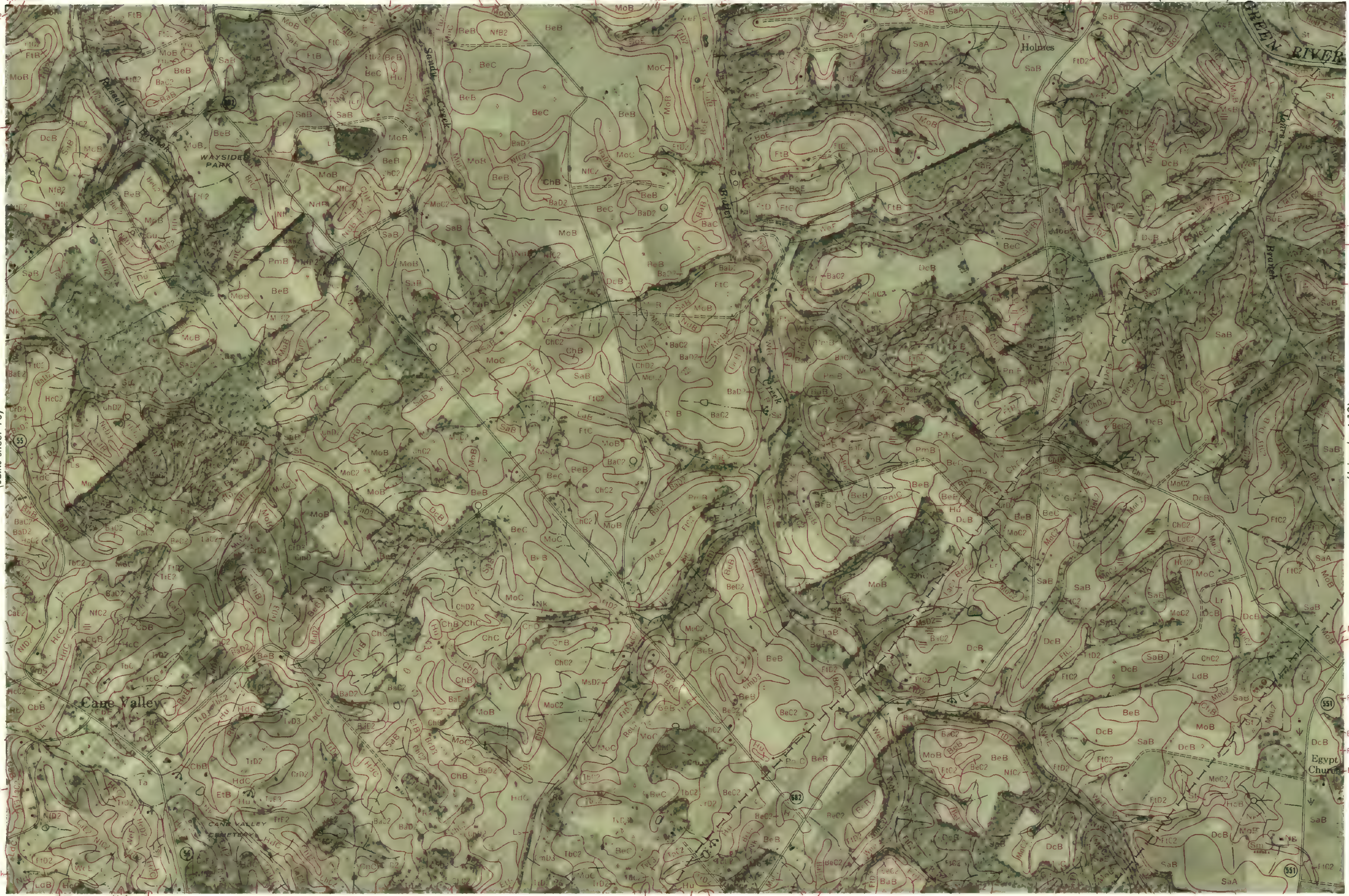
ADAIR COUNTY, KENTUCKY — SHEET NUMBER 11

(11)

(Joins sheet 6)



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(Joins sheet 12)

(Joins sheet 17)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

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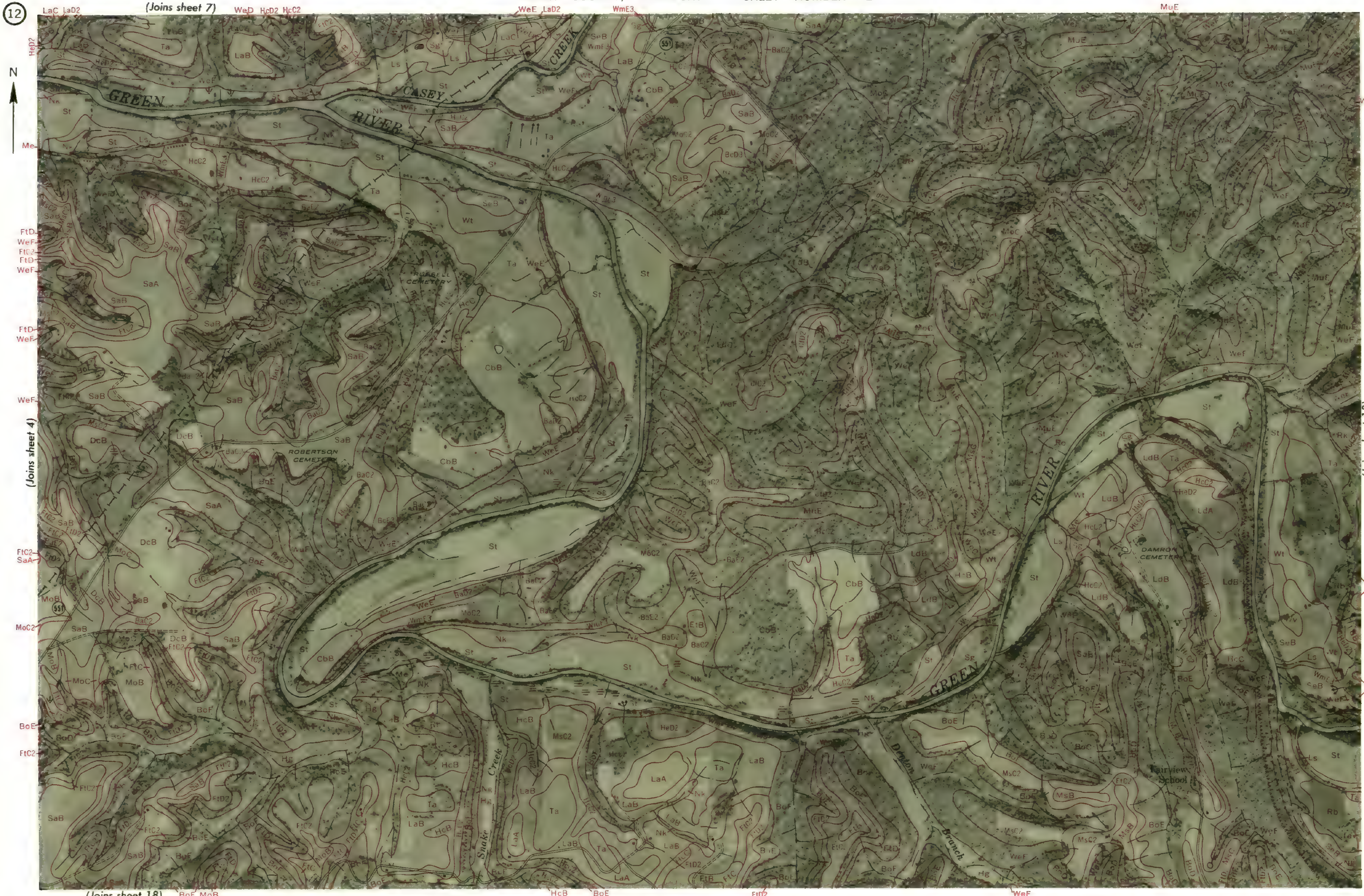

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

ADAIR COUNTY, KENTUCKY — SHEET NUMBER 13

(13)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

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14

(Joins sheet 9)

(Joins sheet 20)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

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0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

ADAIR COUNTY, KENTUCKY — SHEET NUMBER 17

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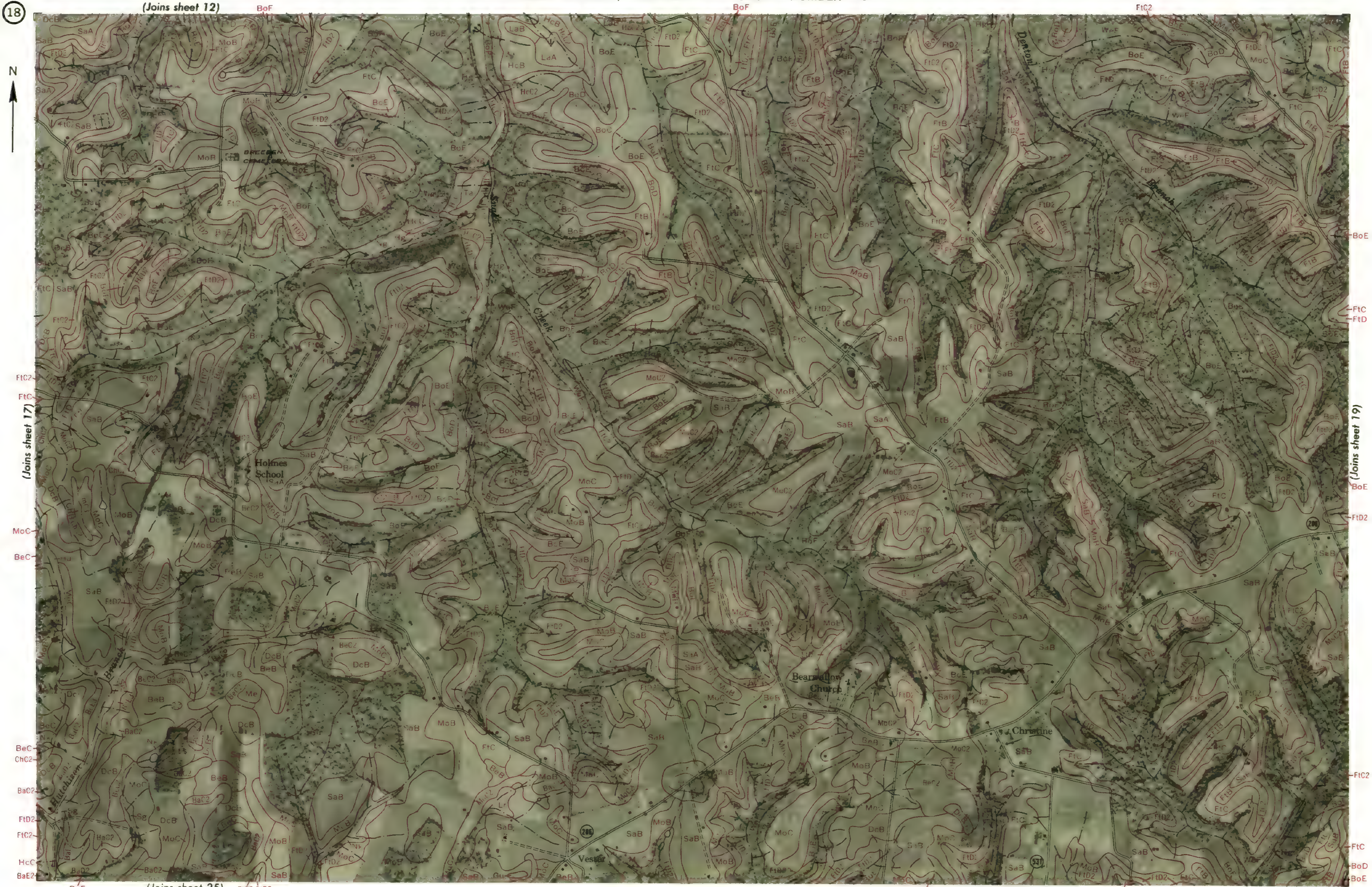

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(Joins sheet 25)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

ADAIR COUNTY, KENTUCKY — SHEET NUMBER 19

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2

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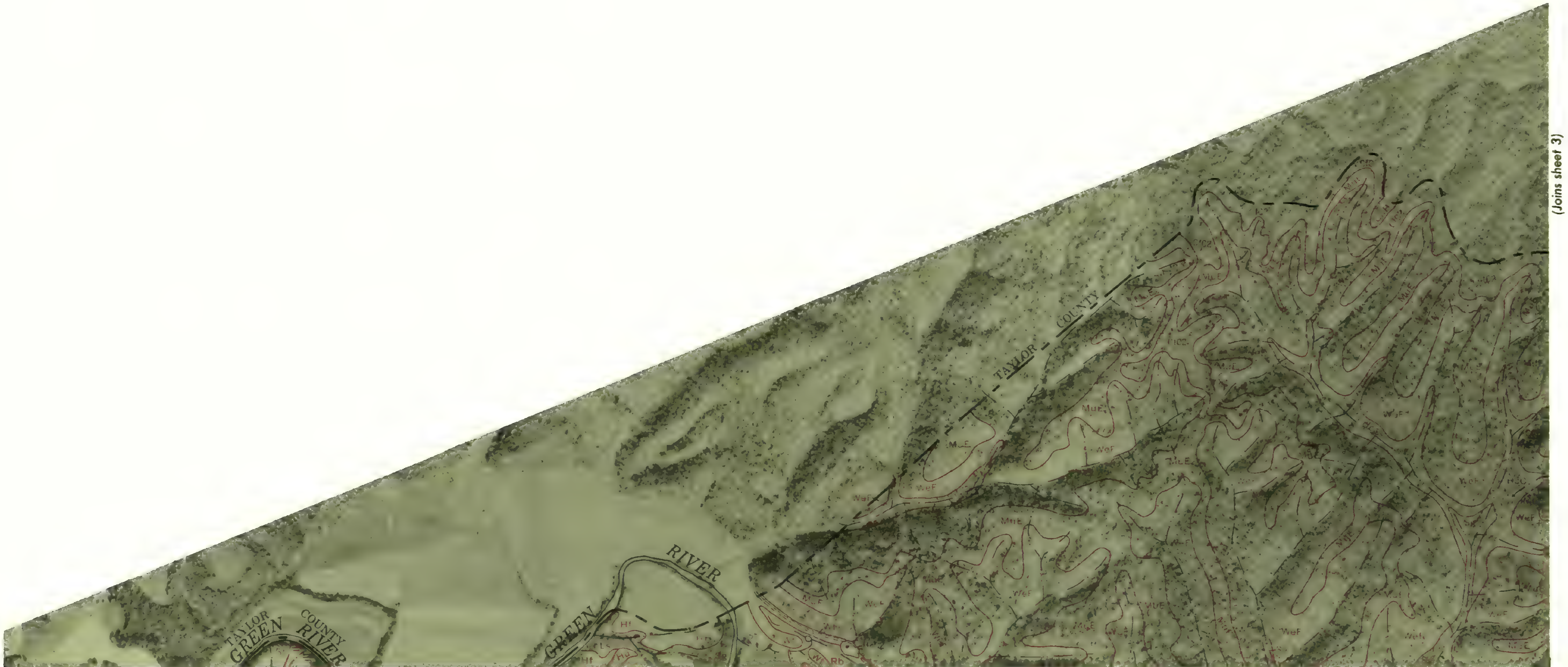

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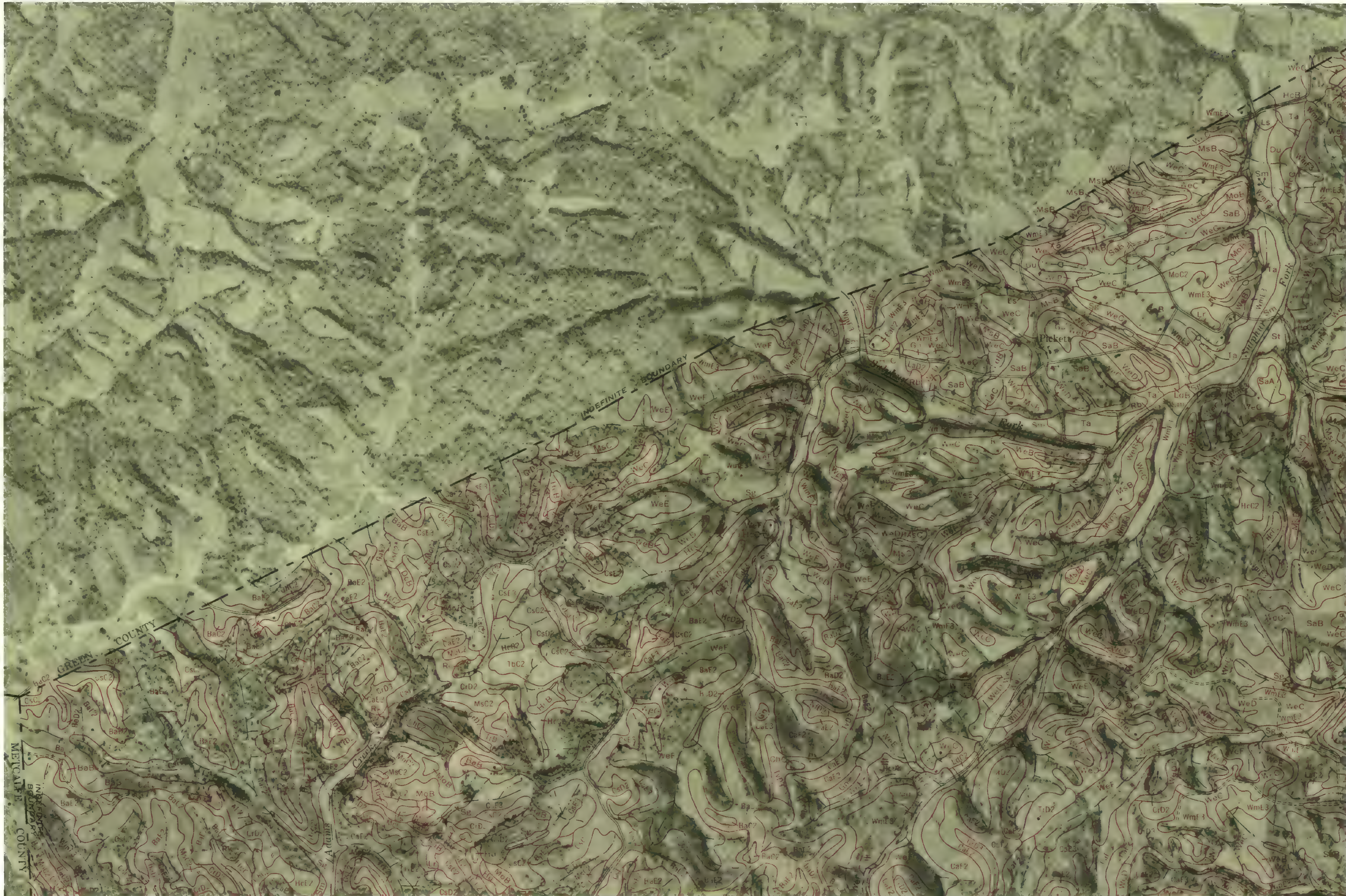

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ADAIR COUNTY, KENTUCKY — SHEET NUMBER 22

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(Joins sheet 24)

(Joins sheet 30)

Scale 1:15 840

0 ½ 1 Mile

0 5000 Feet

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(Joins sheet 17)

(Joins sheet 23)

(Joins sheet 25)

(Joins sheet 31)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(Joins sheet 18)

(Joins sheet 24)

(Joins sheet 26)

(Joins sheet 32)

0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

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26

(Joins sheet 19)

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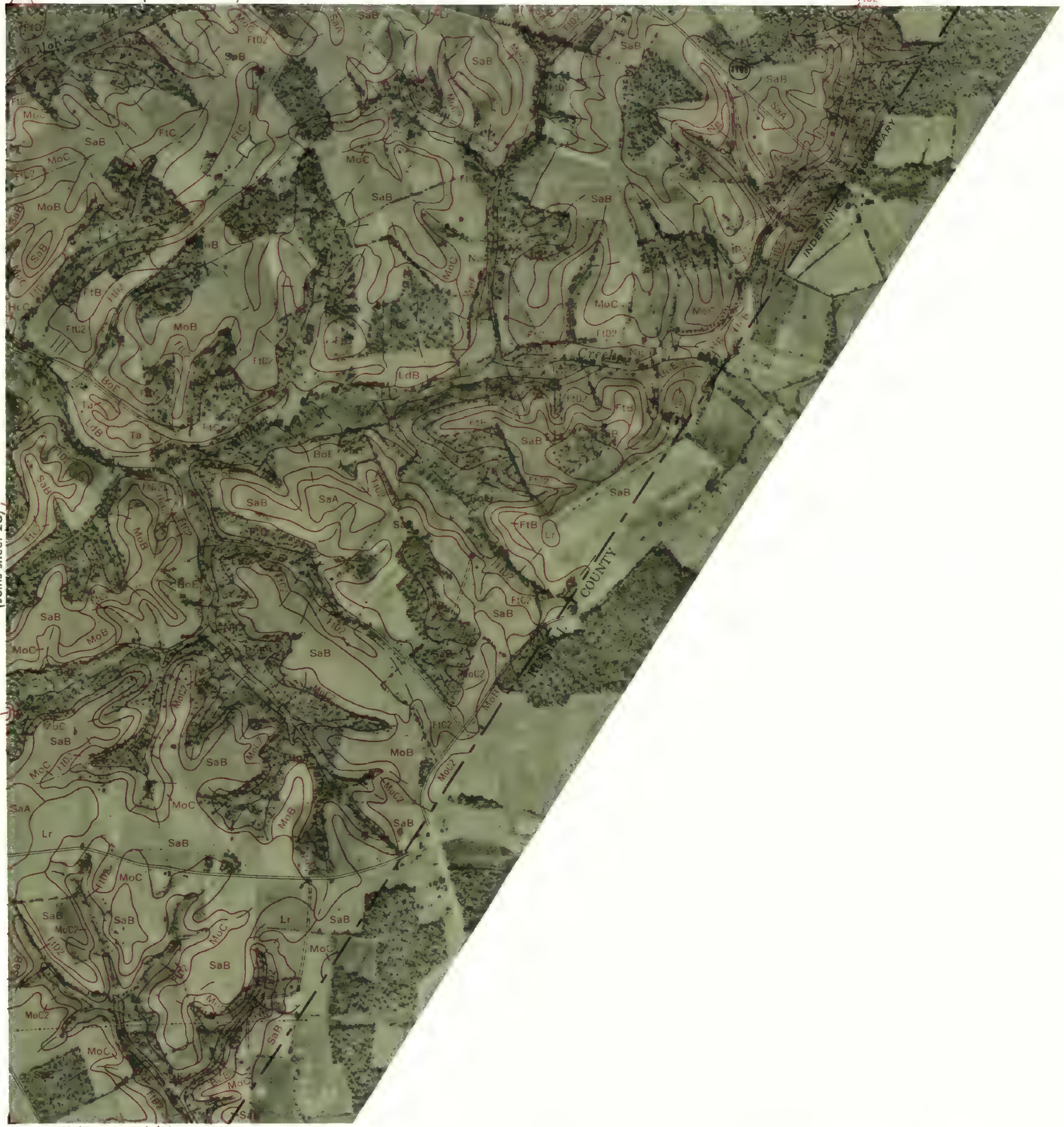
(Joins sheet 33)

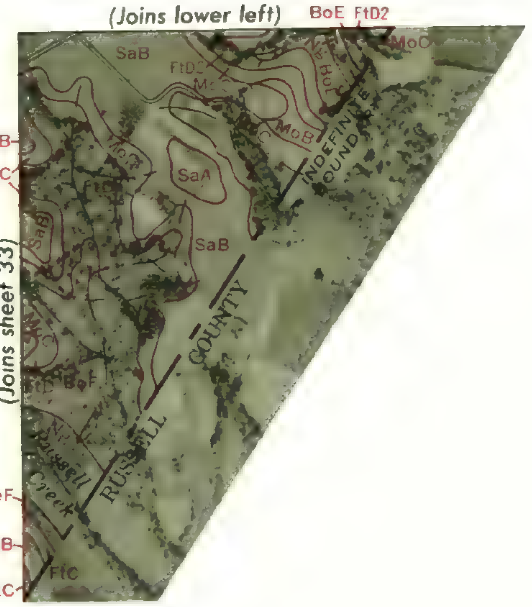
0 ½ 1 Mile

Scale 1:15 840

0 5000 Feet

N





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N

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0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(Joins sheet 22)

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0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

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ADAIR COUNTY, KENTUCKY — SHEET NUMBER 3

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0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

ADAIR COUNTY, KENTUCKY — SHEET NUMBER 30

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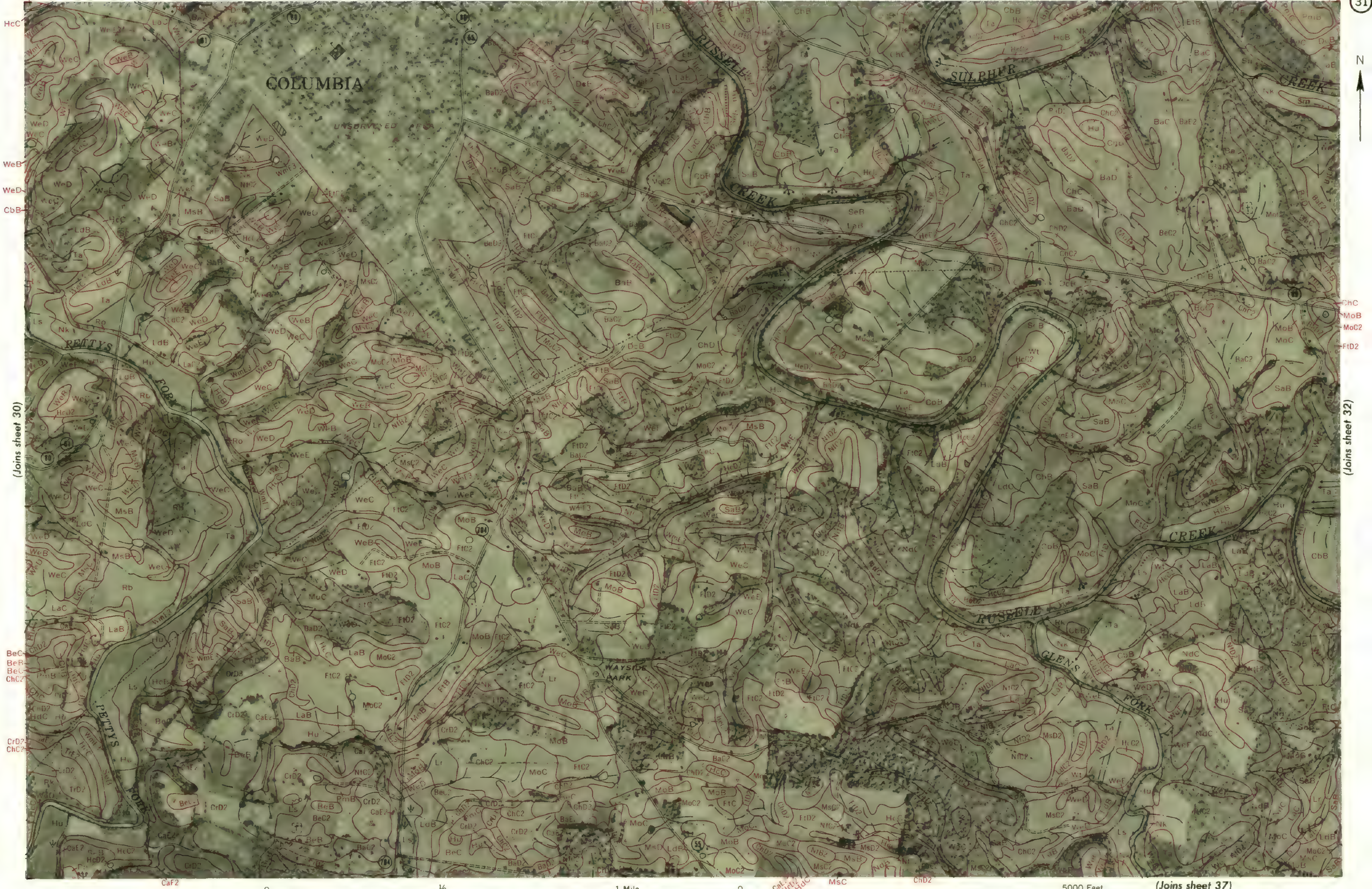
(31)



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(Joins sheet 37)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

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32
N
(Joins sheet 25)
(Joins sheet 31)
(Joins sheet 33)
(Joins sheet 38)
Concord School
Clear Spring Church
Calhoun School
Shiloh Church
Ozark
Sulphur Creek
RUSSELL CREEK
Branch
0
½
1 Mile
Scale 1:15 840
0
5000 Feet

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0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

ADAIR COUNTY, KENTUCKY — SHEET NUMBER 35

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36
(Joins sheet 30)
(Joins sheet 35)
(Joins sheet 37)
(Joins sheet 42)
N
Flatwood School
Johnson School
Scale 1:15 840
0
½
1 Mile
5000 Feet

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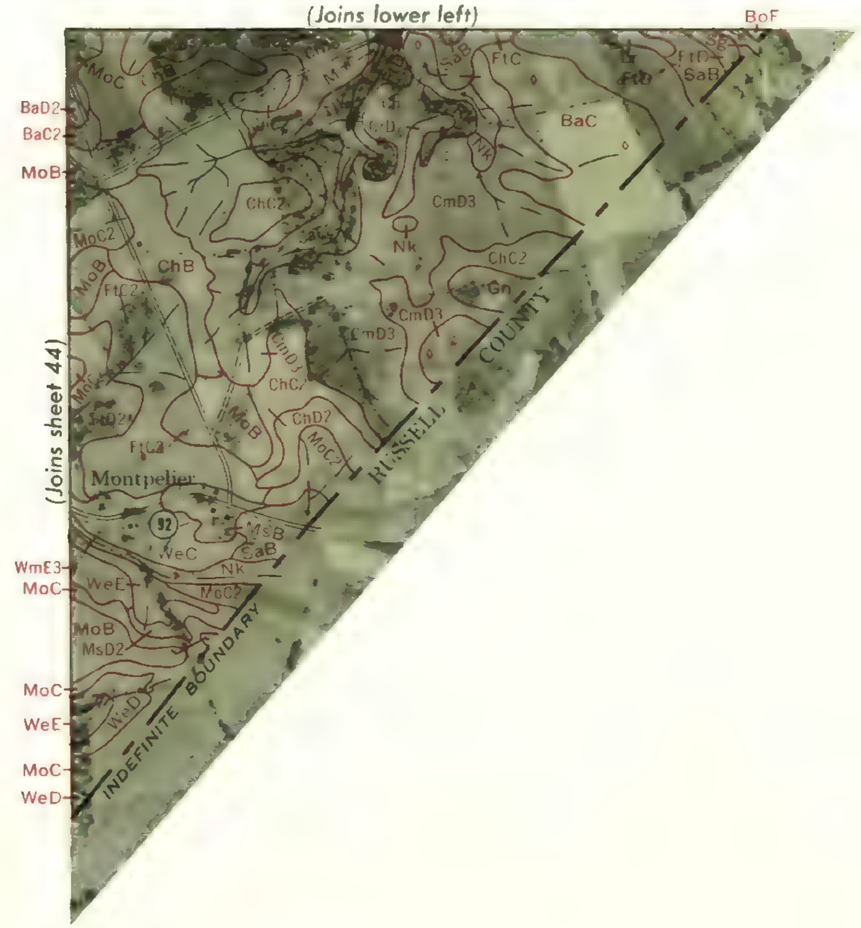
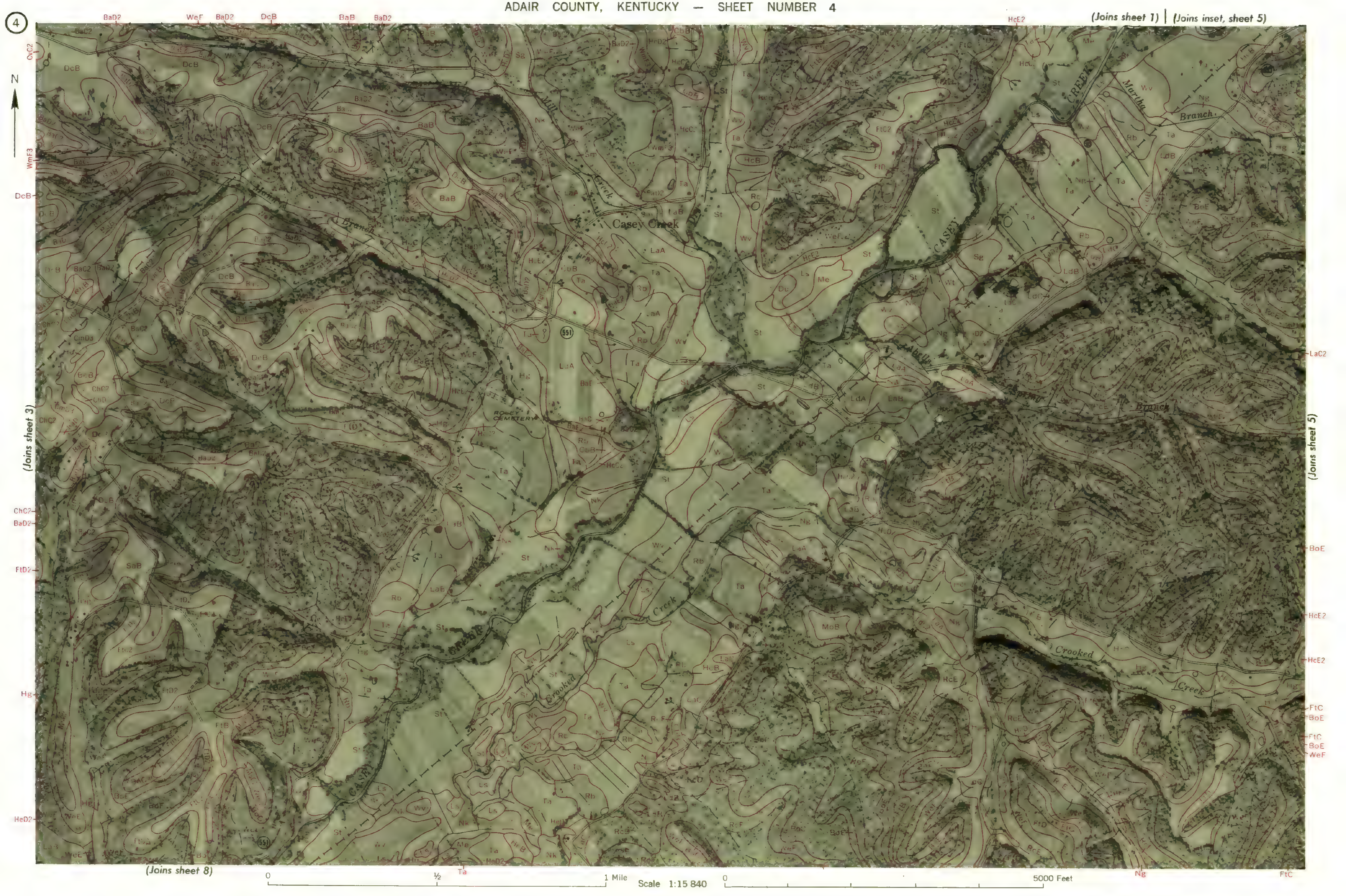
ADAIR COUNTY, KENTUCKY — SHEET NUMBER 38



N

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

This map is one of a set compiled in 1962 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Kentucky Agricultural Experiment Station.


4
(Joins sheet 1)
(Joins inset, sheet 5)
(Joins sheet 3)
(Joins sheet 5)
(Joins sheet 8)
N
Casey Creek
Mill Creek
Martin Branch
CASEY CREEK
Crooked Creek
Branch
ROCKEY CEMETERY
551
0
½
1 Mile
Scale 1:15 840
0
5000 Feet

ADAIR COUNTY, KENTUCKY — SHEET NUMBER 40

(40)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(Joins sheet 35)

(Joins sheet 40)

(Joins sheet 42)

(Joins sheet 46)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

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(Joins sheet 36)

(Joins sheet 47)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

(Joins sheet 37)

(Joins sheet 42)

(Joins sheet 44)

(Joins sheet 48)

Scale 1:15 840

0 ½ 1 Mile

0 5000 Feet

N

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44

(Joins sheet 38)

(Joins sheet 43)

(Joins inset, sheet 39)

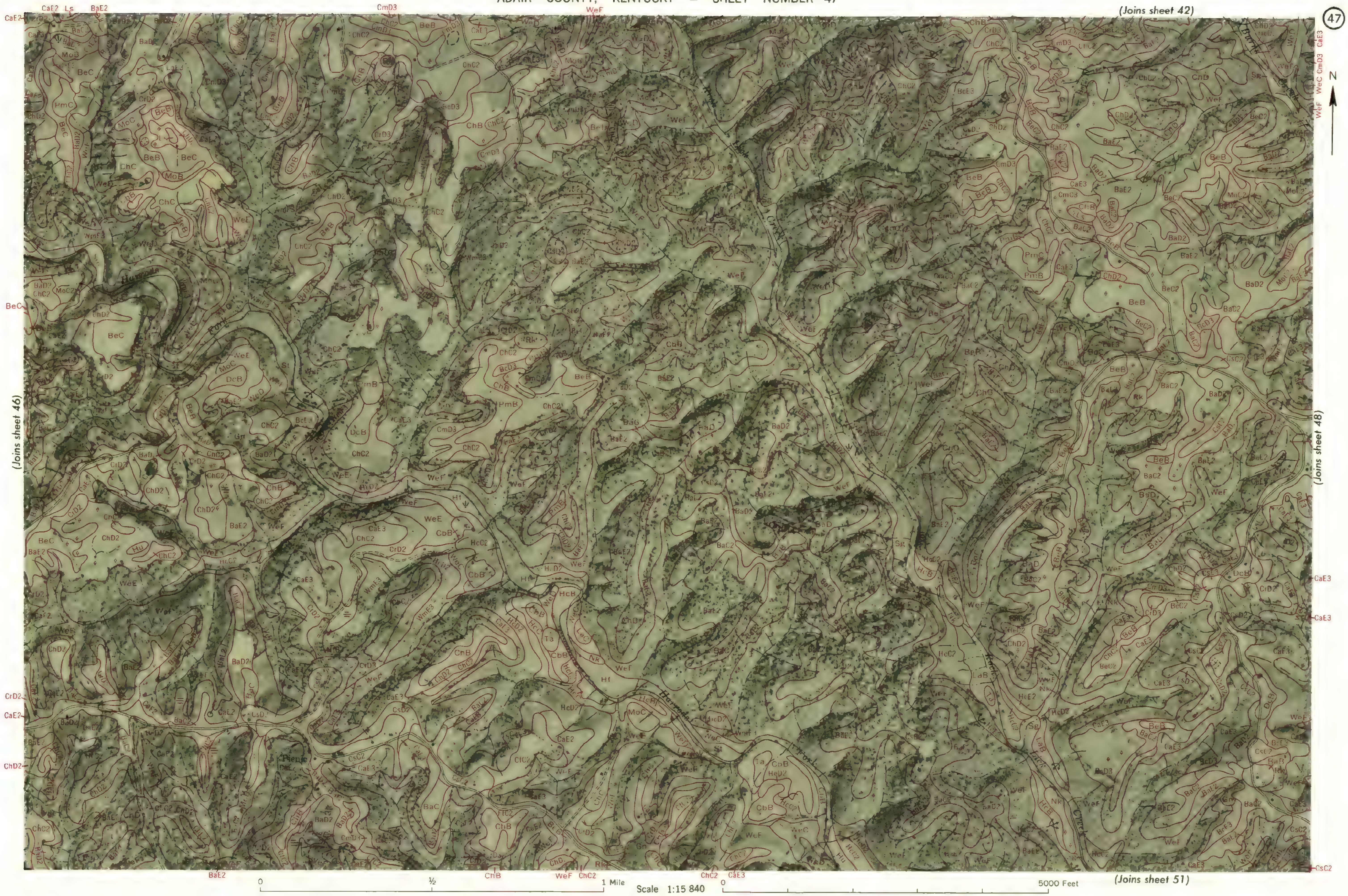
(Joins sheet 49)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

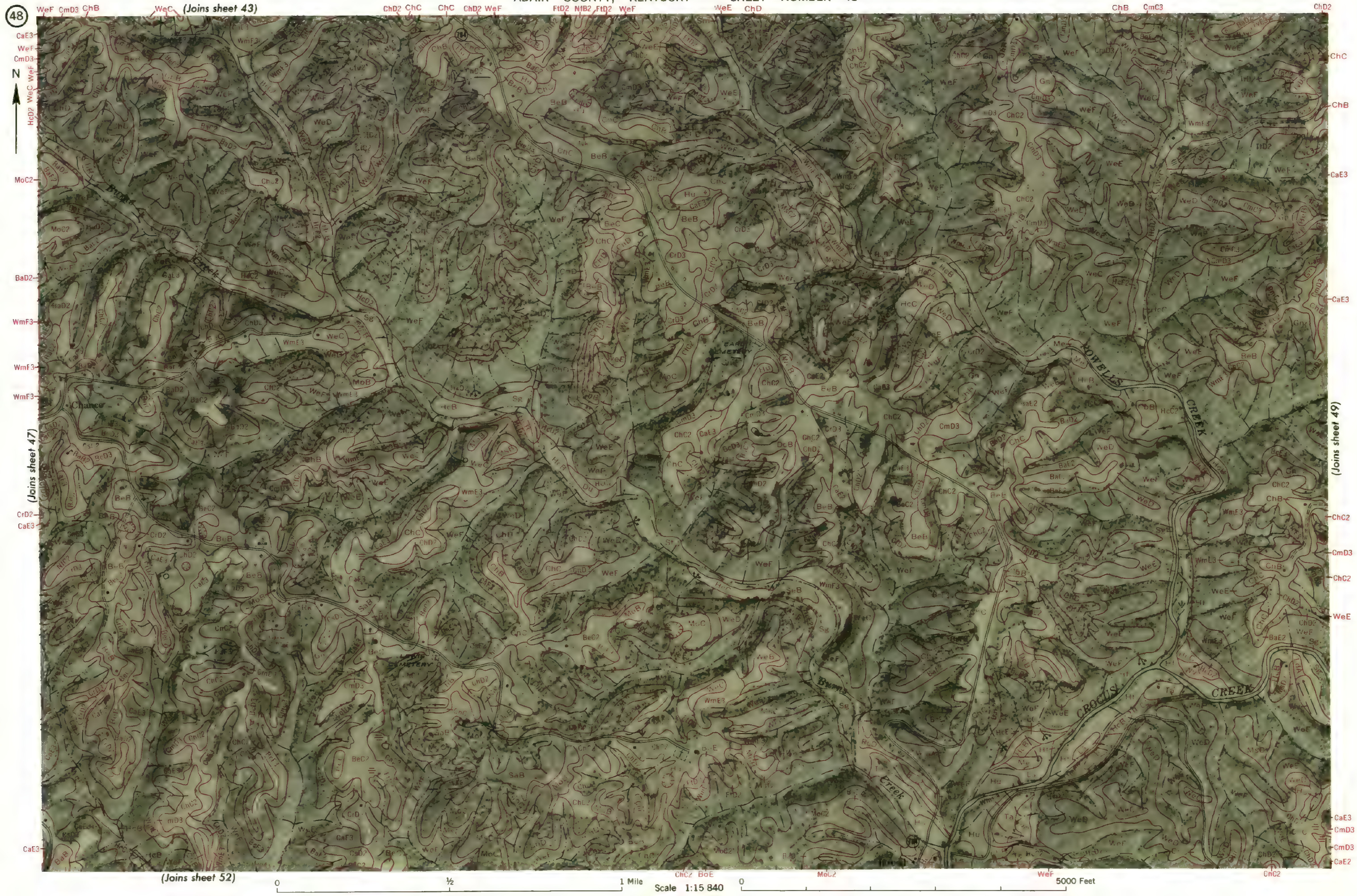
This map is one of a set compiled in 1962 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Kentucky Agricultural Experiment Station


46
N
(Joins sheet 41)
(Joins sheet 45)
(Joins sheet 47)
(Joins sheet 50)
Harrods Fork Church
Toria
Harrods
Breeding
FUDGE CEMETERY
INDEFINITE BOUNDARY
METCALFE COUNTY
0
½
1 Mile
Scale 1:15 840
0
5000 Feet

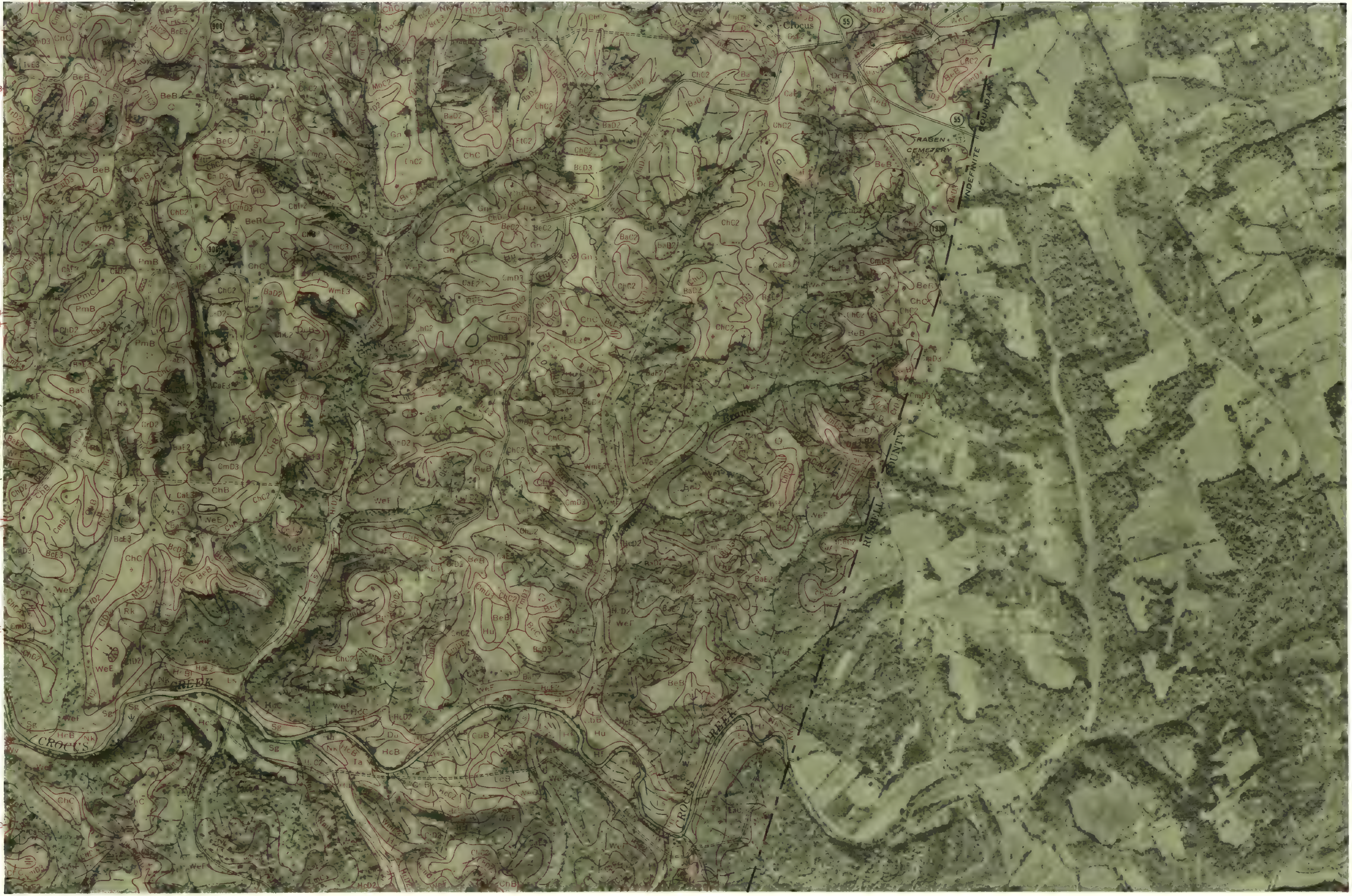


This map is one of a set compiled in 1962 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Kentucky Agricultural Experiment Station.

ADAIR COUNTY, KENTUCKY — SHEET NUMBER 48



(Joins sheet 44)



(Joins sheet 48)

DcB
WeF
ChB
ChB
CmD3
ChB
ChC2
WeE
ChC

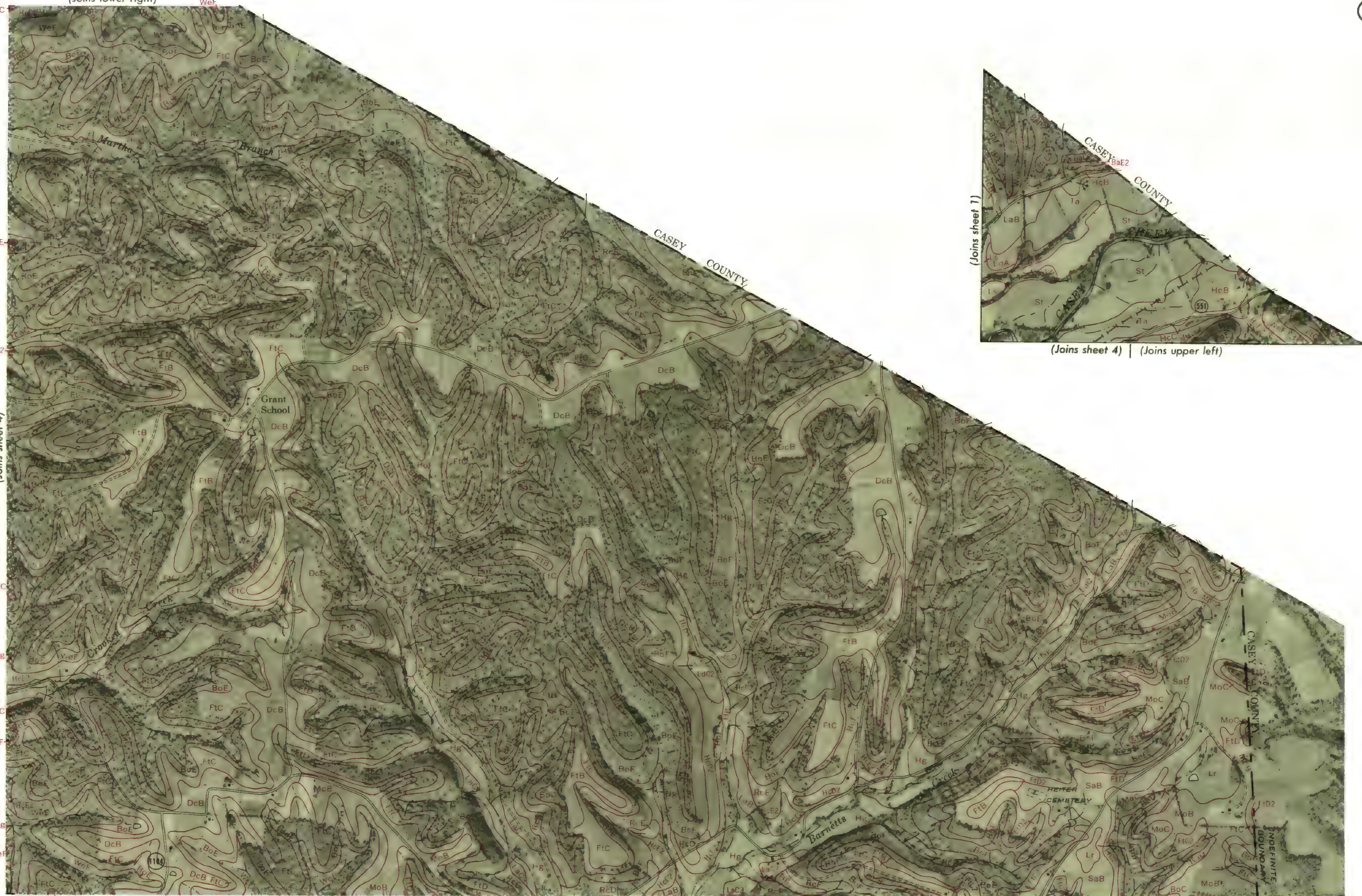
(Joins sheet 53)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

This map is one of a set compiled in 1962 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Kentucky Agricultural Experiment Station.

(Joins lower right)

(Joins sheet 4)



(Joins sheet 1)

(Joins sheet 4) | (Joins upper left)

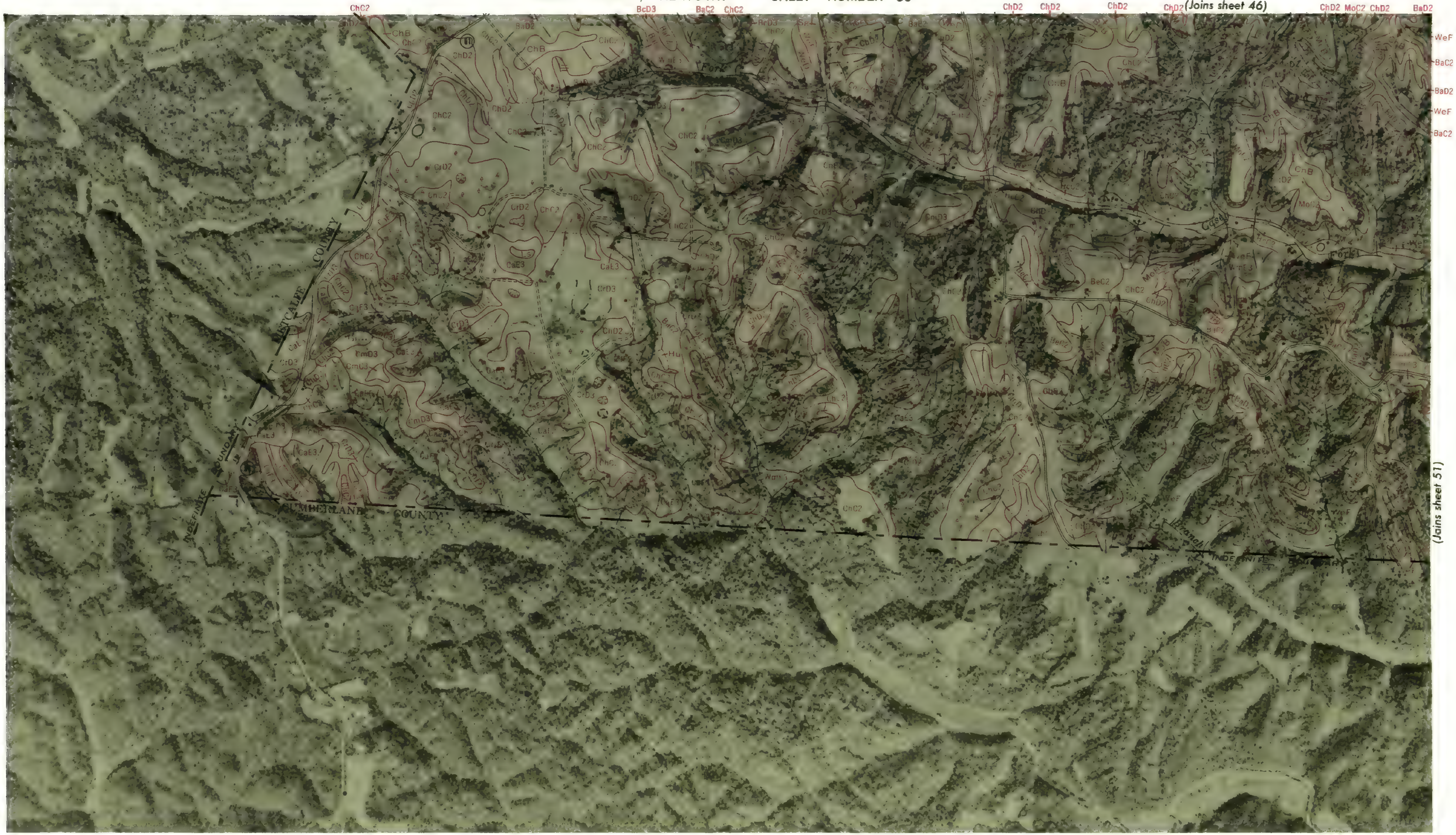
N

(Joins sheet 9)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

This map is one of a set compiled in 1962 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Kentucky Agricultural Experiment Station.

N



0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

ADAIR COUNTY, KENTUCKY — SHEET NUMBER 51

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

This map is one of a set compiled in 1962 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Kentucky Agricultural Experiment Station

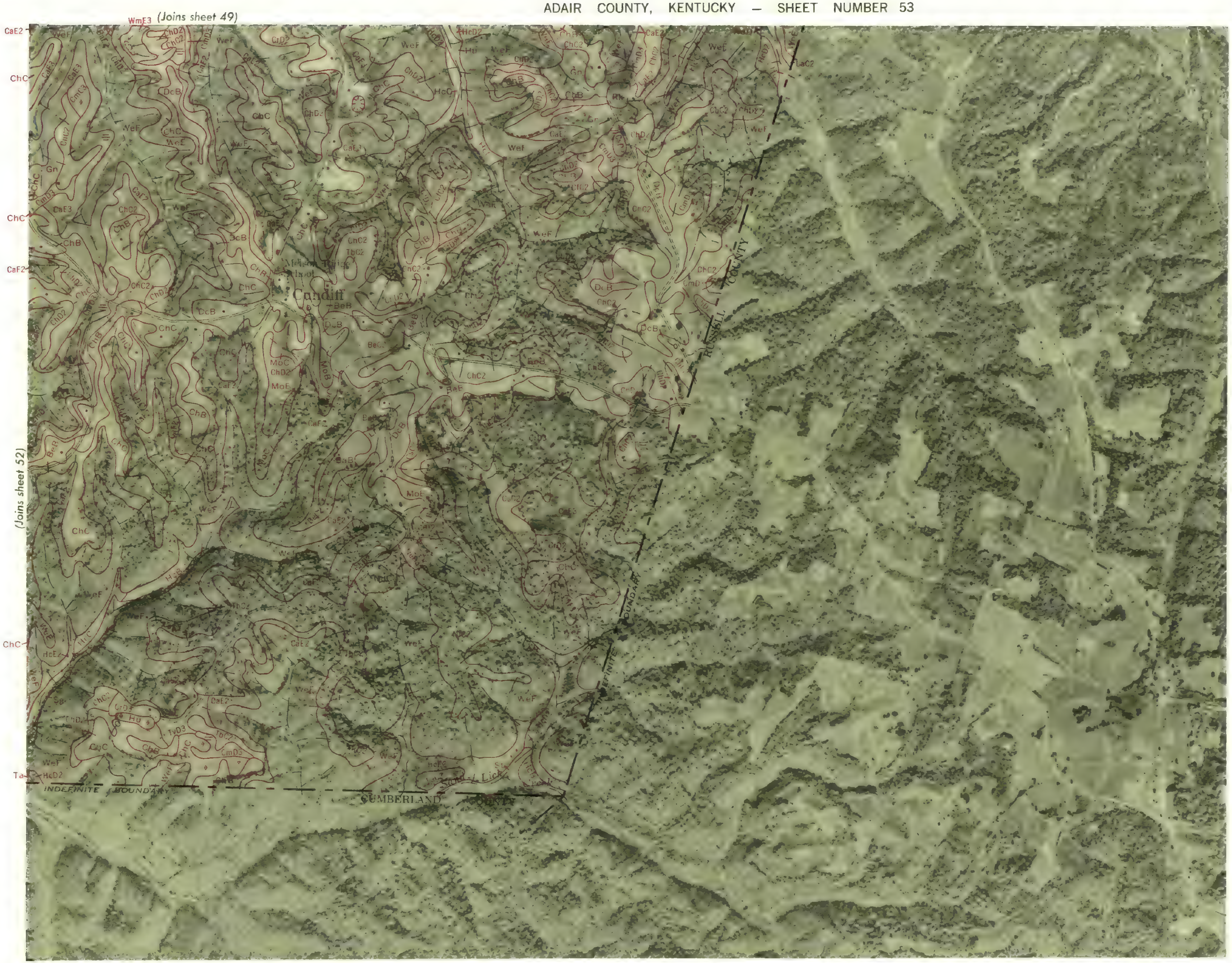
ADAIR COUNTY, KENTUCKY — SHEET NUMBER 52

(Joins sheet 48)

(Joins sheet 51)

(Joins sheet 53)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet



0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

This map is one of a set compiled in 1962 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Kentucky Agricultural Experiment Station.

6

(Joins sheet 2)

N

(Joins inset sheet 10)

(Joins sheet 7)

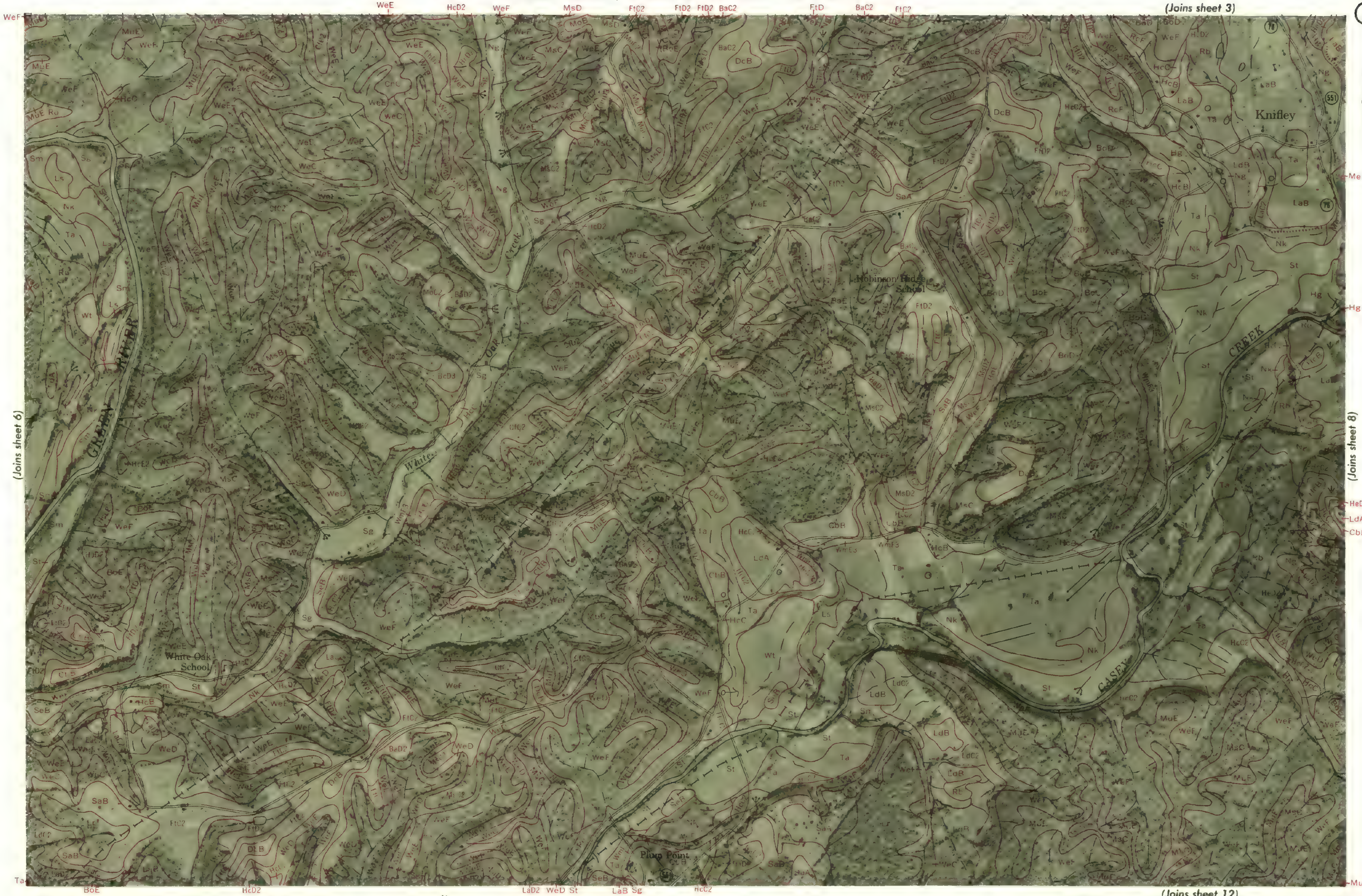
(Joins sheet 11)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

ADAIR COUNTY, KENTUCKY — SHEET NUMBER 7

(Joins sheet 3)

7



(Joins sheet 6)

(Joins sheet 8)

(Joins sheet 12)

0 ½ 1 Mile Scale 1:15 840 0 5000 Feet

This map is one of a set compiled in 1962 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Kentucky Agricultural Experiment Station

Scale 1:15 840

0 ½ 1 Mile

0 5000 Feet

ADAIR COUNTY, KENTUCKY — SHEET NUMBER 9

9

(Joins sheet 5)

(Joins sheet 8)

(Joins sheet 14)

Scale 1:15 840

0 ½ 1 Mile

0 5000 Feet

This map is one of a set compiled in 1962 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Kentucky Agricultural Experiment Station.

GUIDE TO MAPPING UNITS, CAPABILITY UNITS, WOODLAND SUITABILITY GROUPS, AND WILDLIFE PRODUCTIVITY GROUPS

[See table 1, p. 8, for the approximate acreage and proportionate extent of the soils; see table 2, p. 57, for estimated average acre yields, and table 3, p. 60, for estimated yields of wood products. For information that is significant to engineering, see p. 72]

Map symbol	Mapping unit	Page	Capability unit		Woodland suitability group		Wildlife productivity group	
			Symbol	Page	Number	Page	Number	Page
BaB	Baxter cherty silt loam, 2 to 6 percent slopes	10	IIe-11	39	1	64	2	71
BaC	Baxter cherty silt loam, 6 to 12 percent slopes	10	IIIe-6	43	1	64	2	71
BaC2	Baxter cherty silt loam, 6 to 12 percent slopes, eroded	10	IIIe-6	43	1	64	2	71
BaD	Baxter cherty silt loam, 12 to 20 percent slopes	10	IVe-3	48	2	65	2	71
BaD2	Baxter cherty silt loam, 12 to 20 percent slopes, eroded	10	IVe-3	48	2	65	2	71
BaE2	Baxter cherty silt loam, 20 to 30 percent slopes, eroded	10	VIe-1	52	2	65	2	71
BcD3	Baxter cherty silty clay loam, 12 to 20 percent slopes, severely eroded	10	VIe-2	53	6	66	3	72
BcE3	Baxter cherty silty clay loam, 20 to 30 percent slopes, severely eroded	10	VIIe-1	54	6	66	3	72
BeB	Bewleyville silt loam, 2 to 6 percent slopes	11	IIe-1	36	1	64	1	71
BeC	Bewleyville silt loam, 6 to 12 percent slopes	11	IIIe-1	42	1	64	1	71
BeC2	Bewleyville silt loam, 6 to 12 percent slopes, eroded	11	IIIe-1	42	1	64	1	71
BoC	Bodine cherty silt loam, 6 to 12 percent slopes	11	IVs-2	52	3	65	3	72
BoD	Bodine cherty silt loam, 12 to 20 percent slopes	11	VIs-3	54	3	65	3	72
BoE	Bodine cherty silt loam, 20 to 30 percent slopes	11	VIIs-1	56	3	65	3	72
BoF	Bodine cherty silt loam, 30 to 50 percent slopes	11	VIIs-1	56	3	65	3	72
Br	Bruno loamy fine sand	12	IIIs-1	47	11	67	2	71
CaE2	Caneyville very rocky soils, 20 to 30 percent slopes, eroded	12	VIIs-2	56	2	65	3	72
CaE3	Caneyville very rocky soils, 20 to 30 percent slopes, severely eroded	12	VIIs-2	56	7	66	3	72
CaF2	Caneyville very rocky soils, 30 to 45 percent slopes, eroded	12	VIIs-2	56	2	65	3	72
CaF3	Caneyville very rocky soils, 30 to 45 percent slopes, severely eroded	12	VIIs-2	56	7	66	3	72
CbB	Captina silt loam, 2 to 6 percent slopes	13	IIe-6	37	13	68	2	71
CfC2	Christian fine sandy loam, 6 to 12 percent slopes, eroded	14	IIIe-3	43	1	64	2	71
CfD2	Christian fine sandy loam, 12 to 20 percent slopes, eroded	14	IVe-4	48	2	65	2	71
ChB	Christian silt loam, 2 to 6 percent slopes	13	IIe-2	37	1	64	1	71
ChC	Christian silt loam, 6 to 12 percent slopes	13	IIIe-2	42	1	64	1	71
ChC2	Christian silt loam, 6 to 12 percent slopes, eroded	13	IIIe-2	42	1	64	1	71
ChD	Christian silt loam, 12 to 20 percent slopes	14	IVe-3	48	2	65	2	71
ChD2	Christian silt loam, 12 to 20 percent slopes, eroded	14	IVe-3	48	2	65	2	71
CmC3	Christian silty clay loam, 6 to 12 percent slopes, severely eroded	13	IVe-11	50	6	66	2	71
CmD3	Christian silty clay loam, 12 to 20 percent slopes, severely eroded	14	VIe-2	53	6	66	2	71
CrD2	Christian very rocky soils, 8 to 20 percent slopes, eroded	14	VIs-1	54	2	65	2	71
CrD3	Christian very rocky soils, 12 to 20 percent slopes, severely eroded	14	VIIs-2	56	6	66	3	72
CsC2	Christian-Baxter cherty loams, 6 to 12 percent slopes, eroded	14	IIIe-6	43	1	64	2	71
CsD2	Christian-Baxter cherty loams, 12 to 20 percent slopes, eroded	15	IVe-3	48	2	65	2	71
CsE2	Christian-Baxter cherty loams, 20 to 30 percent slopes, eroded	15	VIe-1	52	2	65	2	71
CsE3	Christian-Baxter cherty loams, 20 to 30 percent slopes, severely eroded.	15	VIIe-1	54	6	66	3	72
CtE	Colyer shaly silt loam, 12 to 30 percent slopes	15	VIIs-1	56	9	67	3	72
CvC2	Cookeville silt loam, 6 to 12 percent slopes, eroded	16	IIIe-2	42	1	64	1	71
DcB	Dickson silt loam, 2 to 6 percent slopes	16	IIe-10	38	10	67	1	71
Du	Dunning silt loam	17	IIIw-7	47	15	68	3	72
EtB	Etowah silt loam, 2 to 6 percent slopes	17	IIe-1	36	1	64	1	71
EtC	Etowah silt loam, 6 to 12 percent slopes	17	IIIe-1	42	1	64	1	71
FtB	Frankstown cherty silt loam, 2 to 6 percent slopes	18	IIe-11	39	1	64	2	71
FtC	Frankstown cherty silt loam, 6 to 12 percent slopes	18	IIIe-6	43	1	64	2	71
FtC2	Frankstown cherty silt loam, 6 to 12 percent slopes, eroded	18	IIIe-6	43	1	64	2	71
FtD	Frankstown cherty silt loam, 12 to 20 percent slopes	18	IVe-4	48	2	65	2	71
FtD2	Frankstown cherty silt loam, 12 to 20 percent slopes, eroded	18	IVe-4	48	2	65	2	71
Gn	Gullied land	18	VIIe-4	55	6	66	3	72
Gu	Guthrie silt loam	18	IVw-1	51	15	68	3	72
HcB	Humphreys cherty silt loam, 2 to 6 percent slopes	19	IIe-11	39	12	68	2	71
HcC	Humphreys cherty silt loam, 6 to 12 percent slopes	19	IIIe-6	43	12	68	2	71
HcC2	Humphreys cherty silt loam, 6 to 12 percent slopes, eroded	19	IIIe-6	43	12	68	2	71
HcD2	Humphreys cherty silt loam, 12 to 20 percent slopes, eroded	19	IVe-4	48	12	68	2	71
HcE	Humphreys cherty silt loam, 20 to 30 percent slopes	19	VIe-1	52	12	68	2	71
HcE2	Humphreys cherty silt loam, 20 to 30 percent slopes, eroded	19	VIe-1	52	12	68	2	71
HdC	Humphreys silt loam, 6 to 12 percent slopes	20	IIIe-2	42	12	68	1	71
HeD2	Humphreys cherty silt loam, shallow, 12 to 20 percent slopes, eroded	19	VIe-1	52	9	67	2	71
Hf	Huntington fine sandy loam	20	I-1	35	11	67	1	71
Hg	Huntington gravelly loam	20	IIs-1	41	11	67	2	71
Hu	Huntington silt loam	20	I-1	35	11	67	1	71
LaA	Landisburg cherty silt loam, 0 to 2 percent slopes	21	IIw-2	40	13	68	2	71
LaB	Landisburg cherty silt loam, 2 to 6 percent slopes	21	IIIe-15	46	13	68	2	71
LaC	Landisburg cherty silt loam, 6 to 12 percent slopes	21	IVe-16	51	13	68	3	72
LaC2	Landisburg cherty silt loam, 6 to 12 percent slopes, eroded	21	IVe-16	51	13	68	3	72
LaD2	Landisburg cherty silt loam, 12 to 20 percent slopes, eroded	21	VIe-8	53	13	68	3	72
LdA	Landisburg silt loam, 0 to 2 percent slopes	21	IIw-2	40	13	68	2	71
LdB	Landisburg silt loam, 2 to 6 percent slopes	21	IIe-7	38	13	68	2	71
LdC	Landisburg silt loam, 6 to 12 percent slopes	21	IIIe-9	44	13	68	2	71
LdC2	Landisburg silt loam, 6 to 12 percent slopes, eroded	21	IIIe-9	44	13	68	3	72
Lr	Lawrence silt loam	22	IIIw-1	46	14	68	2	71
Ls	Lindside silt loam	22	I-2	35	11	67	1	71
Me	Melvin silt loam	23	IIIw-5	47	15	68	3	72
MoB	Mountview silt loam, 2 to 6 percent slopes	23	IIe-5	37	1	64	2	71
MoC	Mountview silt loam, 6 to 12 percent slopes	23	IIIe-3	43	1	64	2	71
MoC2	Mountview silt loam, 6 to 12 percent slopes, eroded	23	IIIe-3	43	1	64	2	71
MsB	Mountview silt loam, shallow, 2 to 6 percent slopes	23	IIIe-10	44	8	66	2	71
MsC	Mountview silt loam, shallow, 6 to 12 percent slopes	24	IVe-6	49	8	66	2	71
MsC2	Mountview silt loam, shallow, 6 to 12 percent slopes, eroded	24	IVe-6	49	8	66	2	71
MsD	Mountview silt loam, shallow, 12 to 20 percent slopes	24	VIe-1	52	9	67	2	71
MsD2	Mountview silt loam, shallow, 12 to 20 percent slopes, eroded	24	VIe-1	52	9	67	2	71
MuE	Muskingum very fine sandy loam, 18 to 30 percent slopes	24	VIIe-1	54	9	67	3	72
NdB	Needmore silt loam, 2 to 6 percent slopes	25	IIIe-14	45	4	65	2	71
NdC	Needmore silt loam, 6 to 12 percent slopes	25	IVe-8	50	4	65	2	71
NeD3	Needmore silty clay, 8 to 20 percent slopes, severely eroded	25	VIIe-2	55	7	66	3	72
NfB2	Needmore silty clay loam, 2 to 6 percent slopes, eroded	25	IIIe-14	45	4	65	2	71
NfC2	Needmore silty clay loam, 6 to 12 percent slopes, eroded	25	IVe-8	50	4	65	3	72
NfD2	Needmore silty clay loam, 12 to 20 percent slopes, eroded	25	VIe-1	52	5	66	3	72
Ng	Newark gravelly silt loam	26	IIw-6	41	15	68	2	71
Nk	Newark silt loam	25	IIw-4	40	15	68	2	71
PmB	Pembroke silt loam, 2 to 6 percent slopes	26	IIe-1	36	1	64	1	71
PmC	Pembroke silt loam, 6 to 12 percent slopes	26	IIIe-1	42	1	64	1	71
Rb	Robertsville silt loam	26	IVw-1	51	15	68	3	72
RcD	Rockcastle silt loam, 12 to 20 percent slopes	27	VIe-8	53	9	67	3	72
RcE	Rockcastle silt loam, 20 to 30 percent slopes	27	VIIe-2	55	9	67	3	72
RcF	Rockcastle silt loam, 30 to 40 percent slopes	27	VIIe-2	55	9	67	3	72
Rk	Rock land	27	VIIs-5	56	7	66	3	72
Ro	Rock outcrop	27	VIIIs-1	57			3	72
SaA	Sango silt loam, 0 to 2 percent slopes	28	IIw-2	40	10	67	2	71
SaB	Sango silt loam, 2 to 6 percent slopes	28	IIe-7	38	10	67	2	71
SeB	Sequatchie silt loam, 0 to 4 percent slopes	28	I-3	36	11	67	1	71
Sg	Staser gravelly loam	29	IIs-1	41	11	67	2	71
Sm	Staser loam	29	I-1	35	11	67	1	71
St	Staser silt loam	28	I-1	35	11	67	1	71
Ta	Taft silt loam	29	IIIw-1	46	15	68	2	71
TbC2	Talbott silt loam, 6 to 12 percent slopes, eroded	29	IVe-8	50	4	65	2	71
TrD2	Talbott very rocky silt loam, 12 to 20 percent slopes, eroded	30	VIs-1	54	5	66	3	72
TrE2	Talbott very rocky silt loam, 20 to 30 percent slopes, eroded	30	VIIs-2	56	5	66	3	72
TvD3	Talbott very rocky silty clay, 12 to 20 percent slopes, severely eroded	30	VIIs-2	56	7	66	3	72
TvE3	Talbott very rocky silty clay, 20 to 30 percent slopes, severely eroded	30	VIIs-2	56	7	66	3	72
WeB	Westmoreland shaly silt loam, 2 to 6 percent slopes	31	IIIe-13	45	8	66	2	71
WeC	Westmoreland shaly silt loam, 6 to 12 percent slopes	31	IVe-6	49	8	66	3	72
WeD	Westmoreland shaly silt loam, 12 to 20 percent slopes	30	VIe-8	53	9	67	3	72
WeE	Westmoreland shaly silt loam, 20 to 30 percent slopes	31	VIIe-2	55	9	67	3	72
WeF	Westmoreland shaly silt loam, 30 to 55 percent slopes	31	VIIe-2	55	9	67	3	72
WmE3	Westmoreland shaly silty clay loam, 12 to 30 percent slopes, severely eroded.	31	VIIe-3	55	6	66	3	72
WmF3	Westmoreland shaly silty clay loam, 30 to 50 percent slopes, severely eroded.	31	VIIe-3	55	6	66	3	72
Wt	Whitwell silt loam	31	IIw-4	40	11	67	2	71
Wv	Wolftever silt loam	32	IIw-1	39	11	67	2	71

SOIL LEGEND

The first capital letter of each symbol is the first one of the soil name. A second capital letter, A, B, C, D, E, or F, shows the slope. Symbols without a slope letter are those of nearly level soils, such as Staser loam, or of land types that have a considerable range of slope, such as Gullied land. A final number, 2 or 3, shows that the soil is eroded or severely eroded.

SYMBOL	NAME
BaB	Baxter cherty silt loam, 2 to 6 percent slopes
BaC	Baxter cherty silt loam, 6 to 12 percent slopes
BaC2	Baxter cherty silt loam, 6 to 12 percent slopes, eroded
BaD	Baxter cherty silt loam, 12 to 20 percent slopes
BaD2	Baxter cherty silt loam, 12 to 20 percent slopes, eroded
BaE2	Baxter cherty silt loam, 20 to 30 percent slopes, eroded
BcD3	Baxter cherty silty clay loam, 12 to 20 percent slopes, severely eroded
BcE3	Baxter cherty silty clay loam, 20 to 30 percent slopes, severely eroded
BeB	Bewleyville silt loam, 2 to 6 percent slopes
BeC	Bewleyville silt loam, 6 to 12 percent slopes
BeC2	Bewleyville silt loam, 6 to 12 percent slopes, eroded
BoC	Bodine cherty silt loam, 6 to 12 percent slopes
BoD	Bodine cherty silt loam, 12 to 20 percent slopes
BoE	Bodine cherty silt loam, 20 to 30 percent slopes
BoF	Bodine cherty silt loam, 30 to 50 percent slopes
Br	Bruno loamy fine sand
CaE2	Caneyville very rocky soils, 20 to 30 percent slopes, eroded
CaE3	Caneyville very rocky soils, 20 to 30 percent slopes, severely eroded
CaF2	Caneyville very rocky soils, 30 to 45 percent slopes, eroded
CaF3	Caneyville very rocky soils, 30 to 45 percent slopes, severely eroded
CbB	Captina silt loam, 2 to 6 percent slopes
CfC2	Christian fine sandy loam, 6 to 12 percent slopes, eroded
CfD2	Christian fine sandy loam, 12 to 20 percent slopes, eroded
ChB	Christian silt loam, 2 to 6 percent slopes
ChC	Christian silt loam, 6 to 12 percent slopes
ChC2	Christian silt loam, 6 to 12 percent slopes, eroded
ChD	Christian silt loam, 12 to 20 percent slopes
ChD2	Christian silt loam, 12 to 20 percent slopes, eroded
CmC3	Christian silty clay loam, 6 to 12 percent slopes, severely eroded
CmD3	Christian silty clay loam, 12 to 20 percent slopes, severely eroded
CrD2	Christian very rocky soils, 8 to 20 percent slopes, eroded
CrD3	Christian very rocky soils, 12 to 20 percent slopes, severely eroded
CsC2	Christian-Baxter cherty loams, 6 to 12 percent slopes, eroded
CsD2	Christian-Baxter cherty loams, 12 to 20 percent slopes, eroded
CsE2	Christian-Baxter cherty loams, 20 to 30 percent slopes, eroded
CsE3	Christian-Baxter cherty loams, 20 to 30 percent slopes, severely eroded
CtE	Colyer shaly silt loam, 12 to 30 percent slopes
CvC2	Cookeville silt loam, 6 to 12 percent slopes, eroded
DcB	Dickson silt loam, 2 to 6 percent slopes
Du	Dunning silt loam
EtB	Etowah silt loam, 2 to 6 percent slopes
EtC	Etowah silt loam, 6 to 12 percent slopes
FtB	Frankstown cherty silt loam, 2 to 6 percent slopes
FtC	Frankstown cherty silt loam, 6 to 12 percent slopes
FtC2	Frankstown cherty silt loam, 6 to 12 percent slopes, eroded
FtD	Frankstown cherty silt loam, 12 to 20 percent slopes
FtD2	Frankstown cherty silt loam, 12 to 20 percent slopes, eroded
Gn	Gullied land
Gu	Guthrie silt loam
HcB	Humphreys cherty silt loam, 2 to 6 percent slopes
HcC	Humphreys cherty silt loam, 6 to 12 percent slopes
HcC2	Humphreys cherty silt loam, 6 to 12 percent slopes, eroded
HcD2	Humphreys cherty silt loam, 12 to 20 percent slopes, eroded
HcE	Humphreys cherty silt loam, 20 to 30 percent slopes
HcE2	Humphreys cherty silt loam, 20 to 30 percent slopes, eroded
HdC	Humphreys silt loam, 6 to 12 percent slopes
HeD2	Humphreys cherty silt loam, shallow, 12 to 20 percent slopes, eroded
Hf	Huntington fine sandy loam
Hg	Huntington gravelly loam
Hu	Huntington silt loam

SYMBOL	NAME
LaA	Landisburg cherty silt loam, 0 to 2 percent slopes
LaB	Landisburg cherty silt loam, 2 to 6 percent slopes
LaC	Landisburg cherty silt loam, 6 to 12 percent slopes
LaC2	Landisburg cherty silt loam, 6 to 12 percent slopes, eroded
LaD2	Landisburg cherty silt loam, 12 to 20 percent slopes, eroded
LdA	Landisburg silt loam, 0 to 2 percent slopes
LdB	Landisburg silt loam, 2 to 6 percent slopes
LdC	Landisburg silt loam, 6 to 12 percent slopes
LdC2	Landisburg silt loam, 6 to 12 percent slopes, eroded
Lr	Lawrence silt loam
Ls	Lindside silt loam
Me	Melvin silt loam
MoB	Mountview silt loam, 2 to 6 percent slopes
MoC	Mountview silt loam, 6 to 12 percent slopes
MoC2	Mountview silt loam, 6 to 12 percent slopes, eroded
MsB	Mountview silt loam, shallow, 2 to 6 percent slopes
MsC	Mountview silt loam, shallow, 6 to 12 percent slopes
MsC2	Mountview silt loam, shallow, 6 to 12 percent slopes, eroded
MsD	Mountview silt loam, shallow, 12 to 20 percent slopes
MsD2	Mountview silt loam, shallow, 12 to 20 percent slopes, eroded
MuE	Muskingum very fine sandy loam, 18 to 30 percent slopes
NdB	Needmore silt loam, 2 to 6 percent slopes
NdC	Needmore silt loam, 6 to 12 percent slopes
NeD3	Needmore silty clay, 8 to 20 percent slopes, severely eroded
NfB2	Needmore silty clay loam, 2 to 6 percent slopes, eroded
NfC2	Needmore silty clay loam, 6 to 12 percent slopes, eroded
NfD2	Needmore silty clay loam, 12 to 20 percent slopes, eroded
Ng	Newark gravelly silt loam
Nk	Newark silt loam
PmB	Pembroke silt loam, 2 to 6 percent slopes
PmC	Pembroke silt loam, 6 to 12 percent slopes
Rb	Robertsville silt loam
RcD	Rockcastle silt loam, 12 to 20 percent slopes
RcE	Rockcastle silt loam, 20 to 30 percent slopes
RcF	Rockcastle silt loam, 30 to 40 percent slopes
Rk	Rock land
Ro	Rock outcrop
SaA	Sango silt loam, 0 to 2 percent slopes
SaB	Sango silt loam, 2 to 6 percent slopes
SeB	Sequatchie silt loam, 0 to 4 percent slopes
Sg	Staser gravelly loam
Sm	Staser loam
St	Staser silt loam
Ta	Taft silt loam
TbC2	Talbott silt loam, 6 to 12 percent slopes, eroded
TrD2	Talbott very rocky silt loam, 12 to 20 percent slopes, eroded
TrE2	Talbott very rocky silt loam, 20 to 30 percent slopes, eroded
TvD3	Talbott very rocky silty clay, 12 to 20 percent slopes, severely eroded
TvE3	Talbott very rocky silty clay, 20 to 30 percent slopes, severely eroded
WeB	Westmoreland shaly silt loam, 2 to 6 percent slopes
WeC	Westmoreland shaly silt loam, 6 to 12 percent slopes
WeD	Westmoreland shaly silt loam, 12 to 20 percent slopes
WeE	Westmoreland shaly silt loam, 20 to 30 percent slopes
WeF	Westmoreland shaly silt loam, 30 to 55 percent slopes
WmE3	Westmoreland shaly silty clay loam, 12 to 30 percent slopes, severely eroded
WmF3	Westmoreland shaly silty clay loam, 30 to 50 percent slopes, severely eroded
Wt	Whitwell silt loam
Wv	Wolftever silt loam

Soil map constructed 1963 by Cartographic Division, Soil Conservation Service, USDA, from 1958 aerial photographs. Controlled mosaic based on Kentucky plane coordinate system, south zone, Lambert conformal conic projection. 1927 North American datum.

ADAIR COUNTY, KENTUCKY
CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail, foot
- Railroad
- Ferries
- Ford
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings
- School
- Church
- Wayside park

Mines and Quarries

Mine dump

Pits, gravel or other

Power lines

Pipe lines

Cemeteries

Dams

Levees

Tanks

Oil wells

Forest fire or lookout station

BOUNDARIES

- National or state
- County
- Township, U. S.
- Section line, corner
- Reservation
- Land grant

DRAINAGE

Streams
- Perennial
- Intermittent, unclass.
  - Crossable with tillage implements
  - Not crossable with tillage implements

Canals and ditches — CANAL, DITCH

Lakes and ponds
- Perennial
- Intermittent

Wells — flowing

Springs

Marsh

Wet spot

RELIEF

Escarpments
- Bedrock
- Other

Prominent peaks

Sinkholes
- Crossable with tillage implements
- Not crossable with tillage implements

Depressions

SOIL SURVEY DATA

- Soil boundary and symbol — Dx
- Gravel
- Stones
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gullies